

A NOTE ON THE HYBRIDIZING OF FREESIAS

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It is hard for us to realize that the modern hybrid freesia with its vivid colors, sturdy growth and pleasing fragrance is the product of the foresight of a few hybridizers who have plied their skill during the past twenty-five or thirty years. It is true that some work with this plant had been done prior to the beginning of the twentieth century but a review of the records of the Royal Horticultural Society of England and the florists' trade journals of the United States shows that very few freesia varieties were listed until after 1905. Those in existence at that time were entirely lacking in the color, size and form found in the worst of the varieties grown by commercial florists today. The many excellent qualities of the freesia and its ready response to the plant-breeders' manipulations destine it to occupy a place of ever increasing importance and popularity.

Freesia refracta Klatt was introduced into England early in the nineteenth century. (Probably in 1816 since it was first described in the Botanical Register of that year.) Aside from its attractive fragrance it offered little floricultural promise with its small, tubular flowers of a dingy, greenish yellow. At a later date a freesia possessing a "pinkish-mauve" flower was found at Humansdorp, South Africa, by a land agent named Armstrong. A white form *F. refracta alba* was introduced in England in 1878 and soon became popular as a florist's flower.

Several hybridists recognized the possibilities of the freesia. Prior to 1900 work had been mainly with pale-tinted selections from seedlings of *F. refracta alba*; also crosses with *F. leichtlinii*, a large yellow variety discovered by Max Leichtlin among some neglected seedlings in an Italian garden (about 1874). One of the first to use *F. armstrongii* in crosses with *F. refracta alba* was Dr. A. Ragionieri of Castello, Italy. At about the same time similar crosses were made at Kew Gardens, England, and by C. G. Van Tubergen of Haarlem, Holland. The results of these and subsequent crosses were several distinct strains of freesias with colors ranging from light yellow to orange, pink to deep red, brown, mauve to deep bluish-lavender, and variegated. For many years prior to his death in 1926 the Rev. Joseph Jacob continued to work with this plant and his lively writings did much to attract the attention of English plant-breeders to the freesia. His stock was taken over by G. H. Dalrymple of Southampton, for the past several years the leading freesia hybridist in England. The stock resulting from the work of Dr. Ragionieri was destroyed during the late world war. (It had been purchased and removed to France.) C. G. Van Tubergen and G. H. Dalrymple are practically the only hybridists in Europe seriously engaged in improving the freesia and their new colored varieties attract much favorable comment both in Europe and the United States.

In the United States the freesia has become popular as a florists' cut-flower. Some idea of its importance may be gained from the fact that between twenty and twenty-five million bulbs (corms) are purchased each year by florists for forcing under glass. Freesia blossoms form an important item in the cut-flower market in all the larger cities of this country during the months of January, February and March. Most of the bulbs sold for forcing are grown in the open ground in southern California.

Until the introduction in America of the variety Purity (*F. refracta alba major*) by the late Rudolph Fischer in 1909 the old *refracta alba* continued to be the freesia of commerce. The varieties produced by Fischer contributed materially to the increased popularity of this plant. The foremost hybridizer in the United States today is Alois Frey formerly of Indiana but now in California. Many of the colored varieties introduced to commerce during the past ten years are of Frey's originations. (Several of the varieties most popular in the United States were originated in Holland by Van Tubergen.) Although the work of Richard Bagg of Hartford, New Jersey, has attracted little attention commercially (until his production of the variety Joan Manda) it is interesting, at least historically, that he has continued his hybridizing since about 1885 when he began crossing *refracta alba* and *leichlinii*. This probably gives Bagg seniority among all freesia hybridists in this country.

A few years ago there appeared a giant white freesia in a group of seedlings in the commercial greenhouses of Elder Brothers of Indianapolis, Indiana. This plant was a seedling from seedlings produced from varieties then in commerce. Little attention had been paid to hand pollination therefore the parentage of the giant white freesia will always remain uncertain. From the off-sets of this single plant, now registered as Elder's Giant White, a large stock of corms has been developed. So different was the Giant White from other varieties in commerce that it seemed destined to become the forerunner of a new race of freesias.

During the past three years it has been my privilege to work with this strain of freesias. Nearly fifty thousand blooming seedlings of random crosses had accumulated. The space being needed it was necessary to choose the best seedlings and discard the rest. The fact that many entirely new flower types were present made the work more interesting and difficult. Several selections from this group are now under observation and may later be introduced to commerce under name.

Our hybridizing program may best be understood by reviewing the planned crosses made during the past three years. In 1927 only three crosses, in 1928 seventeen and in 1929 one hundred seven crosses were made using the best freesia types, especially the Giant White. A cross as here referred to means the use of the pollen of one variety placed upon the stigma of another or the same variety. Often as many as one hundred blossoms were used in a single cross. Seeds of known parentage have amounted to nearly fifteen thousand in a single year. This does not include seed produced late in the season by bee pollinations. Two years are usually required to bring a seedling to maturity and at this time the best types are chosen and the rest discarded. The seedlings saved are increased by vegetative reproduction of cormels and cormlets. Although most of the crosses were made with the idea of obtaining improved flower types, nearly a third was made for the purpose of obtaining a preliminary check on genetic characters such as smooth and spiny pods, internodal lengths, color distribution, etc.

In order to make the work thorough a collection of named freesia varieties now in commerce in this country and Europe has been assembled. This now numbers fifty-four varieties produced by other originators and is probably the largest collection in this country. Several of the varieties are direct importations from Europe under special federal permit and are not to be found elsewhere in the United States. In this connection it is well to state that the freesia is relatively in its infancy when its small number of varieties is compared with

those of the Iris, Gladiolus or Dahlia. This collection of varieties is used in hybridizing and for comparison in the selection of distinct seedling types. In addition to named varieties true freesia species have been imported from South Africa. (Special thanks is due Dr. R. H. Compton, Director of the Botanical Garden at Kirstenbosch, C. P., South Africa, for locating collectors.) Near relatives of the freesia including several Babiana species, Tritonias, Ixias, Sparaxis and Lapeyrousia are also grown in small numbers. Most of the last named forms are grown from seed collected in South Africa. A small two bench greenhouse one hundred feet long has been turned over to experimentation, and the growing of the freesia collection and young seedlings. Additional space in another house brings the total space allotted to this work to nearly twelve hundred square feet of bench surface. This does not include space devoted to the Giant White or other varieties beyond the observation stage. The attitude of Elder Brothers in providing space and equipment for my research is highly appreciated by me, especially from the fact that no effort is made to limit my work to phases having an immediate commercial outlet.

Another phase of investigation includes the cytology of the freesia and other Iridaceae. Although no report is being made at this time, sufficient work has been done to warrant the conclusion that at least one of the freesia seedlings represents a triploid chromosomal type. It is expected that reports on this and the results of other items in my investigations may be ready for publication in the near future.

