

THE TAZETTAS: SOME IDENTITIES, BREEDING, AND CHROMOSOME TREATMENT

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It is rather unusual but during the past fifty years over which the *Daffodil Year Book* has been issued the tazettas have rarely been mentioned, and yet the history, identity, diversity and breeding possibilities of this group are particularly unique. For example, the latter, after numerous failures, finally repeated the 'Silver Chimes' series. The pleasant surprises derived from this particular experiment suggests latent possibilities which have been long ignored.

Early horticultural history dating back 150 years or more describes some seventy or eighty variants amongst the tazettas. One needs only thumb through the fascinating publications of SALISBURY, HAWORTH, HERBERT, BURBIDGE or the early issues of the *Curtis's Botanical Magazine* to realize how diversified this old Mediterranean plant can be, or to become fully aware of the importance which these bulbs held in the gardens of the past century. Unfortunately for us the extensive importation has stripped many native haunts about the Mediterranean quite clean. Finally, as the natural imports fell off, the Dutch tried some breeding, but this activity was soon displaced when the hardier hybrid daffodil took over. Now only a few of the hardiest tazetta clones exist in garden and practically no wild forms can be obtained.

Presumably identity of the few existing garden clones should be possible, but more confusion exists over what is actually 'Scilly White', 'Pearl', 'Grand Primo', 'Grand Monarque', 'Compressa', *italicus*, 'leil d'Or' or *T. aureus* than can be imagined, since climate and environment can bring about striking changes in the appearance of blossoms as well as the number in a head. Two forms of 'Grand no' actually exist and in many instances the one whose cups do not touch out has been accepted as 'Grand Monarque'. This particular tangle of identity is near universal despite the fact that HERBERT,

BURBIDGE and E. A. BOWLES rather clearly defined which plants were which. The best drawings or means of identification are the plates of JORDAN ET FOURREAU's *Icones Florae Europea* which BOWLES referred to in his publication, *The Narcissus*. Unfortunately *Icones Florae Europea* is a very rare book and these plates, T180 and T181, are re-published here as figs. 32 and 33.

Plate T180 distinctly represents the 'Grand Primo Citronier'. The two clones of 'Grand Primo' differ only by one having fading cups which bleach out near white, while the other is non-fading. DEAN HERBERT mentions the fading feature so presumably that particular clone was in circulation previous to 1830. Plate T181 represents 'Grand Monarque', although the bulb is normally far more floriferous when it can be grown under warm, dry summer dormant conditions. If flowered under a sunny environment the blossoms face into the sunshine which leads one to believe that the plant is a form of 'Compressa'. 'Grand Primo' and 'Grand Monarque' can best be distinguished by the former having a shallow bowl-shaped cup containing fine radial pleats or folds as shown in T180, whereas 'Grand Monarque' has more of a cup-shaped trumpet with a deeper rim and stronger shadings of citron.

'Grand Monarque' presumably dates back to 1800 as HAWORTH called it the 'Nosegay' and DEAN HERBERT the 'Czar Monarque'. It has been considered a hybrid along with the other members of the *Tazetta* Div. 8 group (which includes all of the bicolors having pale yellow coronas). Actually, we now have considerable evidence to doubt that any of the older Div. 8 clones are hybrids of Dutch origin. In the first place to effect hybrids most tazetta pollens will not strike and set seed unless temperatures are near 65° or 70°F. The only exception is 'Paper White'. It is quite doubtful if the early Dutch or English breeders were aware of this particular factor as few would have had cause to keep their houses so warm. And secondly, the seedlings which have been obtained from 'Grand Monarque' duplicate the parent bulb sufficiently to rule out hybridism. On the other hand we are not so certain about 'Grand Primo' as the few seeds obtained have never reached the flowering stage. It appears that the vigour and rapid multiplication may be due to some specific genetic disorder which is not passed on.

The well-known *Tazetta* 'Soleil d'Or' also exhibits a few more complexities than generally realized. The clone has been reported to be a triploid but the bulbs seed as freely as 'Grand Monarque' in southern California. One finds one seedling type to be of slightly smaller stature which has particularly viable pollen in cooler areas. A

second seedling form is a direct throwback to *T. aureus* with a cup of the same colour as the yellow perianth. Noticeable variation in the width of the tepals exists. All of the seedlings have been found to be relatively hardy.

In addition to the above yellow-flowered forms an October-flowering hybrid with broad yellow tepals and recessed stigma was recently found. The bulb is a free seeder but a fair portion of the seedlings are near white with relatively narrow tepals not unlike *italicus*. Offhand there may be some 'Paper White' blood present. The tendency to pick up stripe suggests the latter, but if 'Paper White' were a parent then we have difficulty in explaining why the hybrid is so deeply coloured.

An *italicus*-type clone has been in circulation in California for many years. It is quite robust and free flowering. It may be a hybrid as seed has never been obtained. The perianth segments are quite long and pointed and are of a distinct citriny-cream shade. Another common bulb is the Chinese 'Grand Emperor'. This appears in a number of variations including semi and doubles. The plant produces seed and the pollen is potent provided that one works with it at relatively high temperatures. The seedlings show the usual degree of variation which can be attributed to a species. It should have breeding possibilities.

As most readers know the Poetaz hybrids are relatively numerous but apparently none have been affected using *T. aureus*. However, the least-explored area is in the crossing of the trumpet forms with the tazettas. As far as is known only a few Australians have had any significant success, excepting for 'Silver Chimes', the delightful *triandrus albus* × *tazetta* cross. The success of both the trumpet crosses and *triandrus* with *tazetta* has unquestionably been one of having fairly warm sunny conditions during the breeding period. Once this is recognized then hybrid seed develops readily, but it took the writer seventeen years or more to find this out. Currently the writer has been flowering a half-dozen or more *triandrus* × *tazetta* hybrids. Those involving 'Paper White' pollen can be labelled as atrocious, but a *triandrus albus* × 'Grand Monarque' gave an erect, stiff form of 'Silver Chimes' with four blossoms. The cup was light citron. Like 'Grand Monarque' the plant is very reluctant to produce offsets. A second treasure is a wee golden flowered plant bearing a truss of seven or eight blossoms on a sturdy 6-in. scape. The trumpets of the hybrid resemble those of the *triandrus aurantiacus* parent and the perianths are reflexed similarly. Both the cups and perianths have the solid substance of the *tazetta aureus* pollen parent. The name of 'Golden Pleiads' has been tentatively suggested for this

little gem. Obviously, with luck like this other crossings are on the way.

Some breeders may conclude that sterile *tazetta* hybrids are an "end of the road" project since seedlings are not possible. This is no longer so. Techniques have been developed, initially on *Cyrtanthus*, *Amaryllis belladonna* and *Crinum* seed, wherein sprouting seed may be treated with colchicine or acenaphthene and the chromosomes increased accordingly. Tetraploid hybrids of the 'Silver Chimes' cross should be fertile. The possibilities are legion. The writer prefers to use acenaphthene in the treatment since it represents a relatively safe material to handle and does not require the exactness of colchicine solutions. (Colchicine is strictly a laboratory material and is a serious skin irritant.)

In practice a few grammes of acenaphthene are mixed into a half cup of well-washed fine sand, dampened to be observable, and placed in a small plastic container or food dish. Freshly sprouted daffodil seeds are placed on this treated sand with the radicles dipping a sixteenth of an inch or more beneath the surface. The dish is then sealed with a polyethylene cover and set in a shady location. Exposure to the acenaphthene fumes takes two to four weeks. Usually fifteen days suffices at 60°F. Over-treatment burns the tip of the growing radicle, while under-treatment leaves no permanent effect.

The treated seeds, upon removal from the acenaphthene impregnated sand, are planted in well-drained silt sand with the seed exposed above the surface. The control during the next ninety days of growth is particularly critical. A 60°F growing temperature is desirable. The seedlings should not be exposed to bright or direct sunlight or to excessive heat, and distinctly should not be over-watered. Properly-treated seedlings will show serious stunting and will produce broad, blunt foliage. Multiple bud blasting commonly occurs with several stunted seedlings forming about a single radicle. It probably takes six to ten weeks for the acenaphthene vapours to evaporate from the bulblets, but during this period any excessive uptake of moisture will cause cell rupture which has the characteristics similar to freezing in that the live tissue turns a deep brown-black. Bulblets should be encouraged to go dormant. Second-year seedlings represent no serious problem and can be grown like normal plants. Polyploids can be recognized by the coarse foliage or fact that several budsport bulblets are grouped together.

Some work has been attempted on the treatment of mature bulbs using colchicine solution. The basal plate is notched exposing the growing tip. Colchicine solution is dripped into the notch. Care must be taken to separate the small muted bulblets which form along the

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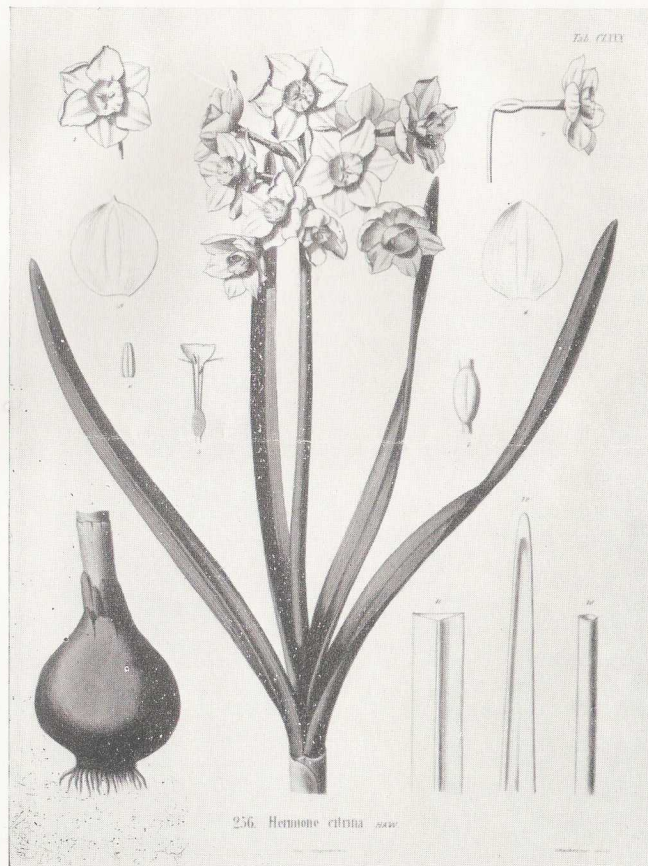
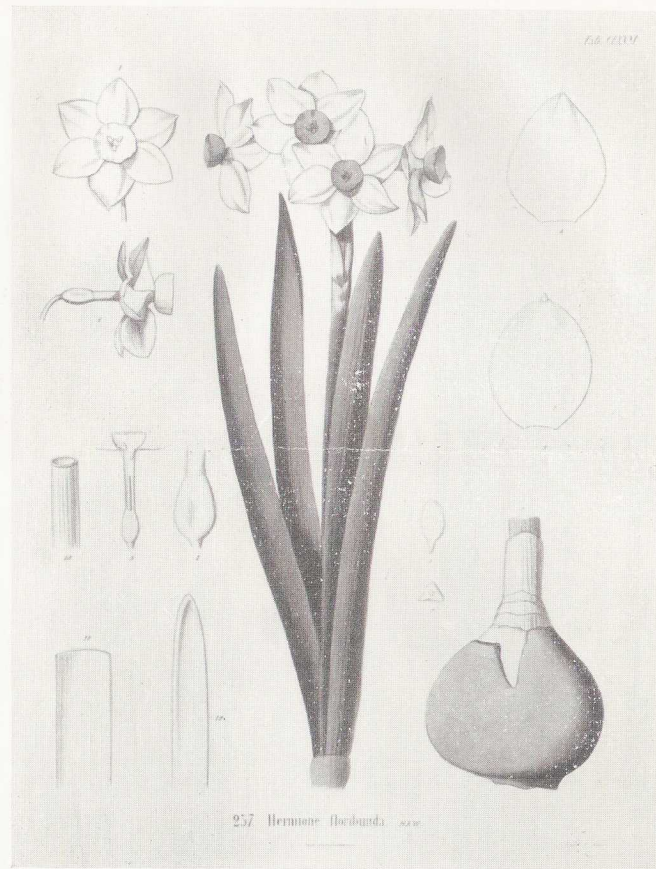


Fig. 32—*Narcissus* 'Grand Primo Citronier' from Jourdan et Fourreau's *Icones ad Floram Europae*,



Photos: J. E. Downward]

Fig. 33—*Narcissus* 'Grand Monarque' from *Icones ad Floram Europae*,

face of the cut. This operation takes place in the late fall and the bulblets are grown on as seedlings. If left attached to the parent bulb the untreated tissue grows at the expense of the muted. Treatment of hybrid *Amaryllis belladonna* and other hybrid seeds indicates that hybrid seed responds better to treatment than species material. The geneticists report that this is due to amphlidioid formation. We would expect the same with daffodil and tazetta hybrids.