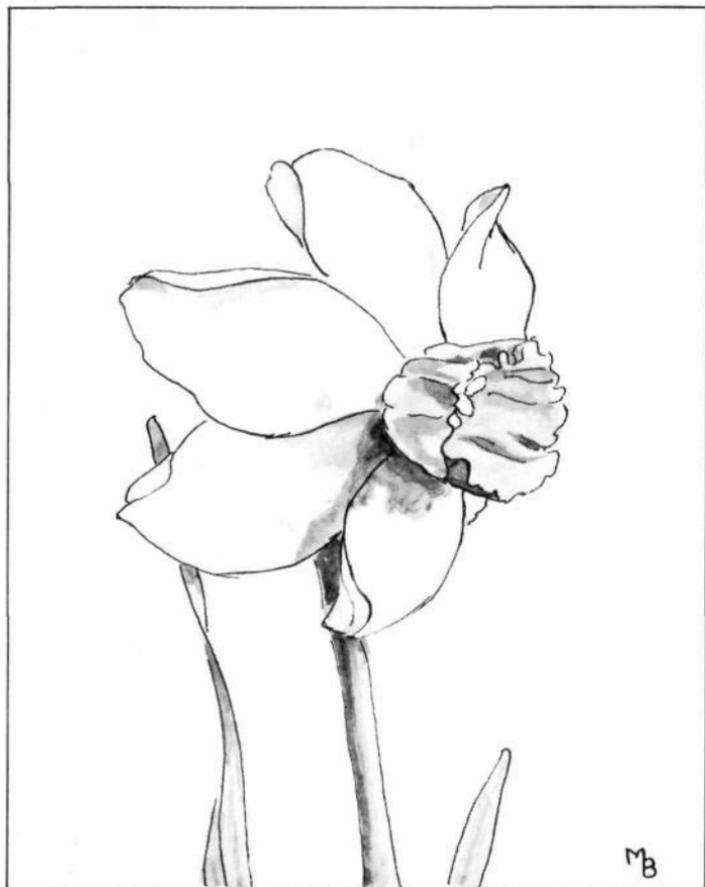


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December 1970

The

# DAFFODIL JOURNAL



Quarterly Publication of

AMERICAN DAFFODIL SOCIETY, INC.

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Quarterly Publication of the American Daffodil Society, Inc.

Volume 7

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DECEMBER, 1970

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Articles and photographs (glossy finish) on daffodil culture and related subjects are invited from members of the Society. Manuscripts should be typewritten double-spaced, and all material should be addressed to the Editor.

DEADLINE FOR THE NEXT ISSUE IS JAN. 15, 1971

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## SCHEDULE OF MEMBERSHIP DUES IN THE AMERICAN DAFFODIL SOCIETY

*Individual Annual* ..... \$5 a year or \$12.50 for three years.  
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## PICTURED ON THE COVER

is Foundling, pink-cupped cyclamineus hybrid bred by Mrs. Reade of Carncairn Daffodils Ltd., Northern Ireland. The drawing is by Marie Bozievich from a photograph by Wells Knierim.

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## A STUDY OF DAFFODIL POLLEN

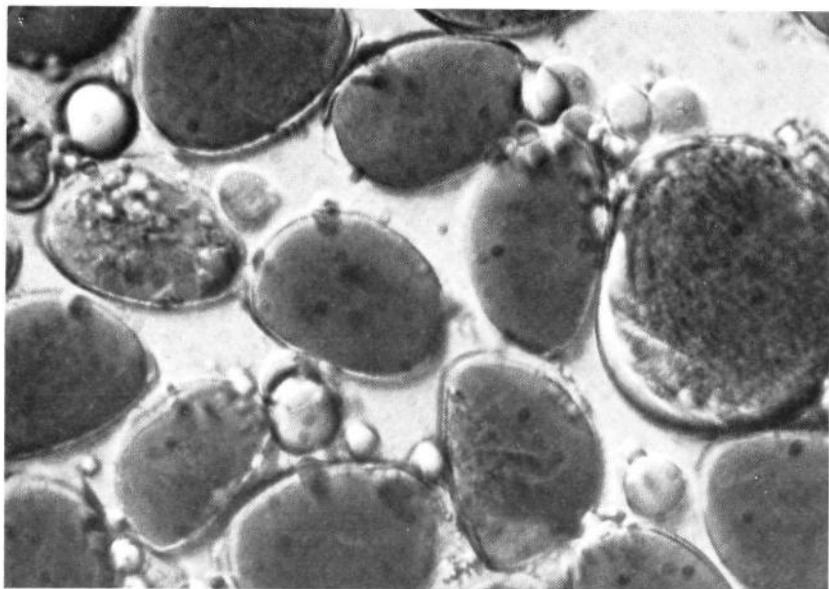
By HELEN K. LINK, *Brooklyn, Indiana*

The word pollen is of Latin origin and means "fine flour." Pollen grains may be airborne or carried from plant to plant by insects. The exine or outer covering of the grain of a plant belonging to a certain family is usually characteristically shaped, textured, or sculptured; thus botanists are able to determine from which plant family the pollen type comes. Exines removed from bogs have been identified from plants which grew there many years ago. Fortunately for the plant morphologist the exine of the pollen grain is one of the most resistant materials known in the organic world. It can be treated with acids or oxidizing agents with little effect on the exine (1). Unfortunately for the biochemist it has been difficult to learn about the chemical composition

of the covering. In recent years some progress has been made in determining the layers of the outer covering by the use of chromic acid. Bailey (1) observed that exines dissolved by heating in monoethanolamine. It is thus possible to remove the exine without disturbing the contents of the grain.

Although there are articles and books about pollen types in general, not much has been written about daffodil pollen grains. The purpose of this paper is to relate what others have learned about pollen types and to give a resumé of experiments with daffodil pollen grains, the method followed, and results of tests to determine percentage of viability.

Daffodils in Division VII, jonquilla hybrids of garden origin, and some of the species were chosen for examination, as a large collection of both old and new varieties of this division were available in the author's garden. Varieties from other divisions were used in experiments as a convenience during the winter months when only material from the coldframe was available. Microscopic slides of germinated pollen grains were made during the blooming season. As each variety



Perconger pollen grains stained immediately after collection. Every grain in the field shows morphological perfection. The white globules are lipid material which is found in abundance when pollen is rich in viable grains. Large grain at the right shows the granular structure of the exine. 460x, 15-second exposure.

*All photographs by Helen K. Link. Unless otherwise noted, film used was Plus X Pan.*

## OFFICIAL CALL

**16th Annual Convention of the American Daffodil Society  
Hotel Sonesta, Hartford, Connecticut  
April 29, 30, and May 1, 1971**

**The New England Region is honored to host the National Convention of the American Daffodil Society.**

**The Connecticut Horticultural Society presents its 10th Annual Daffodil Show and the National Convention Show on Thursday, April 29th and Friday, April 30th at the Pond House, Elizabeth Park, Hartford. The Harry I. Tuggle, Jr., Memorial Trophy, a handsome silver tray, will be offered for the first time. An entry calls for 3 stems of 12 different varieties from at least 3 RHS Divisions. All are invited to bring flowers to be entered before 10:30 a.m., April 29th.**

**The Board of Directors will meet at 4:30 p.m., April 29th.**

**The Annual Members' Meeting will be held at 7:45 p.m., April 30th.**

**A detailed program of events will appear in the March issue of the Journal.**

**Walter E. Thompson, President**

came into bloom, the fresh pollen grains were collected in the field, or freshly opened blooms were cut and the slides prepared at night.

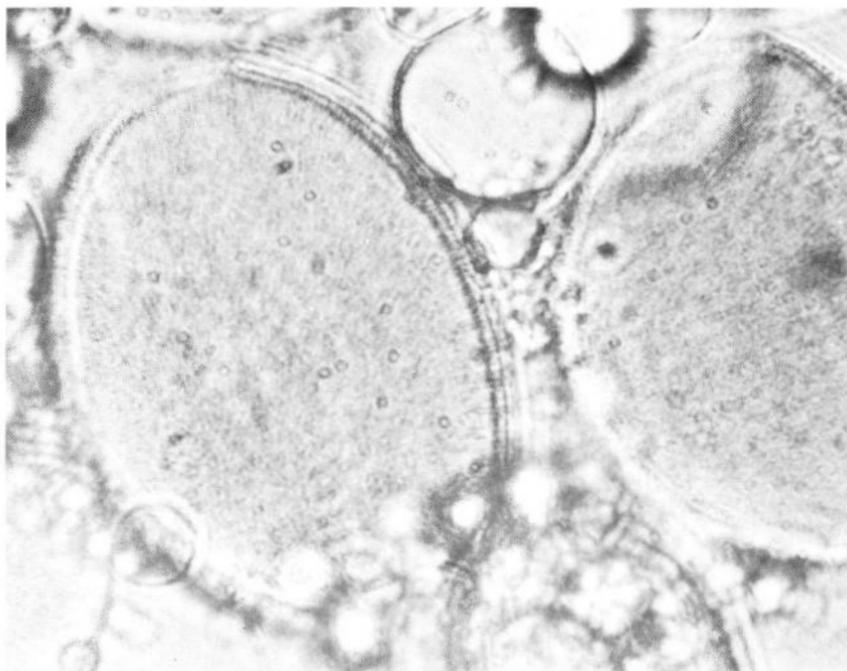
The hybridizer often envisions seedling blooms from certain parentage but is unable to get seeds to set on his crosses because the pollen parent lacks viable pollen grains. With the use of a microscope and a few simple supplies he can make a test for viability of the grains. He can tell immediately upon examination whether grains are morphologically perfect (plump with cytoplasm surrounded by an exine), and within a few hours whether germination will take place under controlled conditions. Records kept over the season will enable him to know what varieties are usually rich in viable pollen grains.

The anatomy and physiology of the pollen grain will now be reviewed briefly in order to give a better understanding of what takes place during pollination and fertilization of the egg by the sperm.

## ANATOMY AND PHYSIOLOGY OF THE DAFFODIL POLLEN GRAIN

The daffodil pollen grain has three main concentric layers: cytoplasm (living matter), intine, and exine. The intine and exine may or may not have sublayers, depending upon the type of pollen grain. The innermost layer or cytoplasm is the living cell which is capable of germinating on the stigma to form the pollen tube. The middle layer is designated as the intine; it is present in all pollen grains and envelops the living cell. It is thought to be composed of cellulose; however, recently, noncellulose components such as pectins and polysaccharides have been found in the intine of some pollen types. The cytoplasm is in close contact with the intine. Thickenings (onci) of the intine occur at the aperture (opening where the pollen tube emerges). The composition of this area differs from the rest of the intine, and it has been discovered that the onci play a part in nourishing the pollen grain tubes by dissolving during the process of germination (1).

The third layer, the outer covering or exine, remains when a grain fails to reach its destination and has perished or when a grain germi-



Daffodil pollen grains viewed under oil immersion. The granular surface and layers of the exine are clearly seen. 970x, 30-second exposure.

nates and grows out of the exine in search of an ovule. The exine of various pollen types is made up of inner and outer layers, for which Erdtman (1) used the terms endexine (inner) and ekexine (outer). They can be distinguished by their staining reaction. The electron microscope has indicated that the endexine may be made up of various layers, some of which are continuous and others which appear only close to the apertures. The ekexine is composed of small radial rodlike elements or granules. Beneath this structure there may be an outer and an inner stratum (tectum and foot layer). Both of these layers may be partial or absent. If the tectum covers most of the layer, the grain is referred to as tectate. If the tectum is absent, the grain is termed intectate.

The exine of the daffodil pollen grain has an intectate structural form which may be described as granular. The substances forming the exine have been called sporopollenins. They are isotropic (having properties of light transmission) and do not contain any cellulose.

The daffodil pollen grain is shaped somewhat like an orange section and has a single furrow or colpus running lengthwise; thus the term *monocolpate* has been applied to this type. The furrow form is considered primitive by botanists. The furrow acts as an expansion mechanism and can accommodate change in volume of the grain to a certain

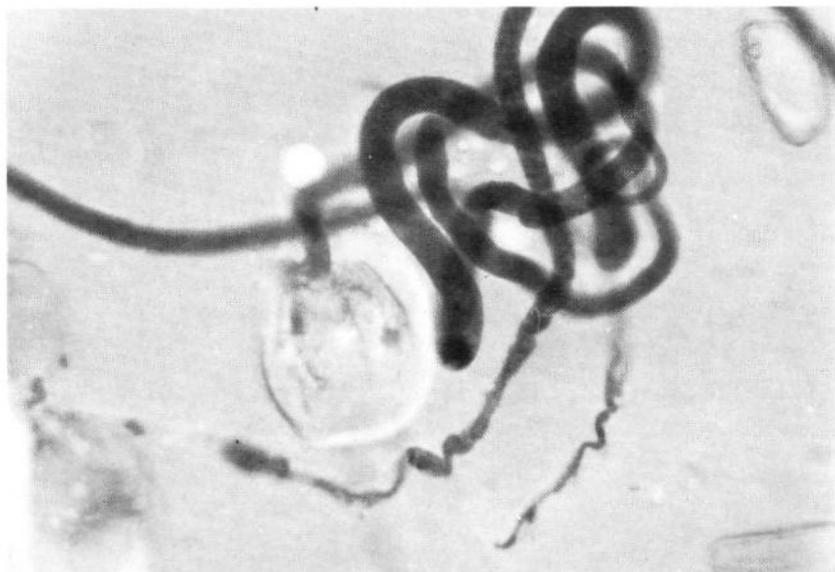


Hathor pollen grain, 600x, 5-second exposure. Malformed tube with split at end. Exine at bottom of picture clearly shows furrow from which tube grows from the grain.

extent. The exine is thin over the furrow, and it is here that the pollen tube emerges when germination occurs. Under certain conditions the grain may swell and burst before it has a chance to germinate.

The sizes of the pollen grains of the daffodil vary depending on the species, variety, or cultural conditions of the plant. Among the hybrids size varies within a variety and also from variety to variety. Wagnitz (1) showed that grains were all the same size after the living contents were removed. He thought that the variation in size was due to osmotic values. His work was not done on the daffodil. In Division VII, jonquilla hybrids, out of 80 varieties studied the largest grains were from Golden Sceptre (Monarch  $\times$  *N. jonquilla*); they measured 60 x 68 microns. The smallest were from Sun Disc (*N. rupicola*  $\times$  *N. poeticus*); they measured 24 x 40 microns. Of the species, wild forms, and wild hybrids, 11 were studied, and *N. scaberulus* had the smallest grains, 16 x 24 microns. All measurements were made with the grains in lateral view and before germination had begun.

Wodehouse (2) suggested that pollen grains should be collected from the first flowers to open on a plant because the late flowers are less vigorous and usually visited by insects which eat the pollen grains.



Golden Sceptre pollen grains germinated for 12 hours on gelatin medium. Exine in center is empty of cytoplasm. While tubes are curled around each other, they show normal growth. Above the empty exine may be seen two tubes which have begun to die back at grain end as tube end elongates. Callose plugs form and keep cytoplasm from leaving tube. 430x, 10-second exposure, Panatomic X film.

Samples of pollen grains taken by the author from first and last blooms on the same plant of *N. jonquilla* showed a 40% drop in viable grains from last blooms compared with grains from those that opened first.

Kurtz and Liverman (3) stated that there is a relationship between pollen-grain characteristics and various weather factors. High temperatures supposedly favor formation of large grains and aridity favors small grains. Repeated cooling of the flower buds causes formation of abnormal pollen rains. Nutrition of the plant also has an influence on the size of the grains.

This writer noted that some varieties have abnormalities that show up during germination in various forms, such as bilateral tube formations or several tubes from the same grain. There is some controversy concerning the cause of abnormal formation of tubes. Some plant physiologists (4) attribute the abnormality to an over-abundance of vesicles fusing in the wall of the pollen tube; others think that the nuclei fuse during early cell division, causing suppression of cell-wall formation. Golden Sceptre and Hathor showed many unusual and interesting formations. These two varieties were studied during three consecutive blooming seasons, and each time the germinating grains showed malformations and multiple tubes. As it was impossible to trace the growth of multiple tubes through the stigma into the ovary, we do not know whether fertilization takes



Golden Sceptre pollen grains — grain in center has formed two tubes. Then one of these has begun to split into two more tubes. 430x, 2-second exposure.

place when branching occurs in the tube or when there are several tubes growing from the same grain. Valencia (5) reported that as many as five tubes were formed from a single pollen grain of evening primrose (*Oenothera* sp.).

The exine of the pollen grain is the seat of an abundant secretion of viscid oil. Faegri (1) stated that the oil coating keeps the pollen grains from dispersing readily and is not found in large amounts in pollen types that are dispersed by wind such as in the genus *Pinus*. Oily pollen grains are more apt to adhere to the feet and body of insects. Brink (6) noted that tubes ceased to grow as soon as reserves (fat) were exhausted. Under the microscope the oil appears to be yellow, and the globules break up into small particles and disappear during germination. A sample of pollen grains from *N. watieri* that tested nearly 90% viable showed a large number of fat globules, so many that the pollen grains felt sticky when rubbed between the fingers. Sassen (4) presumed that these lipids play a part in building of wall membrane and metabolism function, as well as helping in the formation of endoplasmic reticulum.

When a pollen grain settles on the stigma, if conditions are suitable the grain may germinate and begin to grow. If the stigma is too dry the grain may collapse, if too moist it may swell and burst; thus the receptiveness of the stigma, humidity, and temperatures are factors in germination. Only gametes with a certain chromosome number may be able to effect fertilization. Watkins (7) found this to be a cause for non-germination of tubes in studies made on wheat.

The surface of the daffodil stigma examined under the microscope resembles the papillae of the human tongue. The cells are elongated and appear glossy as if covered with a sticky substance. The walls are thick and may be coated with cutin. Some cells are elevated more than others, and when the pollen grain is deposited on the stigma it adheres in a depression between the cells. Kroh (4) stated that in some types of plants (*Cruciferae*) the stigma is covered with a cuticle which the germinating pollen tube dissolves at the point of contact. This permits the pollen tube to grow within the pectin layer of the cell wall. It is open to question whether this growth within the layer results from a breakdown of the cellulose lamellae. In plants where a cuticle on the stigma is present, cutin digestive enzymes have been found in pollen grains whose tubes must penetrate the stigma. Shroch-Bodmer (8) concluded from observations that the pollen grains derive their nourishment from the styler tissue in the form of water, mineral salts, and sugar. The colenchyma (elongated living cells with unevenly thickened walls) of the style was found to be shriveled by the action of pectinase contained in several pollen types. Ellers (8) says that the tube growth depends

entirely on its own resources and that the maximum length of the tube is not affected by the style. He proved this by growing grains in an artificial medium and found them to be the same length as when they were grown on the style.

When the pollen grain germinates, the nucleus divides and forms two cells, the generative cell and the tube cell. The generative cell divides to form two gametes or sperms. The two gametes together with the tube nucleus move down the pollen tube as it grows in search of an ovule. As the tube grows, callose plugs are formed in the tube and the cytoplasm stays ahead of the plugs. The grain end of the tube dies as the growing end elongates, and the exine is left behind on the stigma. When the tube reaches the ovule, it punctures the membrane which covers the micropyle (opening into the ovule); then the tube ruptures and the two sperms enter the ovule. Double fertilization takes place as one sperm unites with the egg, fertilizing it and forming the embryo. The other sperm unites with the previously fused polar nuclei of the ovule, and from this union the endosperm develops which provides adequate food supply for the new plant until it becomes large enough to manufacture its own food by the process of photosynthesis.

Several Russian plant physiologists (4) after having studied various pollen types germinated on a medium showed that L-proline  $C^{14}$  was utilized from the nutrient medium. They also found reduced content of proline in pollen grains with low viability. Tupý (4) stated that proline is the major amino acid in the pollen grains of most plant species and that its content is connected with pollen-grain fertility. In studies made with apple pollen grains. Tupý showed that triploid cultivators produced pollen grains of low fertility and a low proline level when compared with those from diploid cultivars. The proline level decreases as the tubes grow through the style. The proline was found to be concentrated at the tube tip of the pollen grain, at the point where pectin synthesis occurs during tube growth.

Many times a cross is unsuccessful for any one of the following reasons: (1) pollen grains may germinate and the tip of the tube protrudes, but the tube develops no further; (2) the egg cell may not be functional; (3) the egg cell may be functional, but for some reason the fusion of sperm and fused polar nuclei does not take place; (4) pollen grain bursts and cytoplasm is lost before germination occurs; (5) empty grains, devoid of cytoplasm when shed on stigma (commonly termed chaff); (6) pollen grains that germinate are selective with respect to chromosome number; (7) degree of receptiveness of the stigma.

Esser (8) concluded that large diploid grains produced longer tubes than smaller haploid ones because of a larger reserve food supply.

## VIABILITY OF POLLEN GRAINS

We were able to find only a small amount of information concerning the longevity of daffodil pollen grains; however, Holman and Brubaker (9) stated that Molisch (1893) found that pollen grains of *N. poeticus* remained viable 72 days when air dried, and that Takugawa (1914) observed a 98-day viability in *N. tazetta*, using the desiccator method of storage. Mangin tested pollen grains from *N. pseudo-narcissus* and discovered their life to be 28 days.

On April 22, 1965 the author gathered pollen grains from Empress of Ireland and stored them on their anthers, air dried, in a large plastic capsule at room temperature. After 326 days the pollen grains were examined and 21% were morphologically perfect. A sample planted on a gelatin medium for 12 hours was found to have 14% of the grains morphologically perfect, but ungerminated; 2% of the grains had burst; 80% were exines or empty shells; and 4% had germinated and pollen tubes had formed, although the tubes were short in comparison with samples of the fresh grains seeded on the same medium for the same length of time. Another sample of the stored grains was examined after 24 hours, and approximately the same percentage of germination had taken place. The tubes were also short. Two grains had formed two tubes each.

Holman and Brubaker (9) have suggested that not all pollen grains capable of germination are capable of affecting fertilization. They found in experiments made with snapdragon (*Antirrhinum* sp.) pollen grains that some that would not germinate on sugar did so on the stigma. They noted that grains 670 days old germinated on stigmatic tissue but did not bring about fertilization.

The author noted that pollen grains of *N. bulbocodium praecox* stored at room temperature for 381 days showed no germination after 8 hours on a gelatin medium. Pollen grains of *N. bulbocodium romieuxii* stored for the same length of time gave no germination and showed that the cytoplasm had receded from the exine. Part of the same batch of pollen grains was stored for 381 days in a deep freeze in a gelatin capsule sealed in an envelope. When the grains were planted on a gelatin medium for 8 hours there was no sign of germination, but excellent germination took place after 14 hours. In comparing the tube lengths of the fresh pollen grains with those of the frozen grains there was no difference.

Visser (8) discovered that carbon dioxide increased the longevity of pollen grains. He also advocated that humidity be kept between zero and 30% for storage and that when pollen grains are frozen they should be predried before placing them in the freezer in order to prevent the

formation of crystals. He suggested that a 2.5% to 5% sugar solution should be used for germination. If the content of the sugar in the medium is too low many of the grains may burst. Visser states that bursting is positively related to the diffusion rate of water, especially for those pollen types which are sensitive to an ample supply. When grains are germinated on solid substrata under specific conditions of air humidity instead of in sugar solutions, there is less bursting. Bursting is inversely related to the osmotic value of the medium. Bursting decreases with the increasing osmotic value of the medium. The greatest amount of bursting is found in water or saturated air. Starch is found in most pollen types; humidity causes it to disappear. Resting pollen grains lose their starch rather quickly as their age increases. The enzyme activity of some pollen types was found to be much higher in sugar solution than in water.

Boron in the form of boric acid concentration was found in the stigma secretion of the pear. Visser (8) stated that by adding boron to the medium the germination was more than twice as effective when pollen grains that had been stored for a long period were used as compared with the use of those that were germinated directly after collection. The storage of pollen grains decreases the mobility of substances essential for growth; after storage, not enough of these substances may be released for the germination of the tubes. Boric acid has been found to promote tube growth.

The author seeded pollen grains of *N. viridiflorus*, which had been stored for 90 days at room temperature in a capsule. The slide was treated with boric acid, 100 ppm (parts per million). A control slide was also prepared. The slide to which the boric acid was added gave approximately a 10% higher germination than the control slide. Boric acid was added to a slide prepared with fresh pollen grains. There was very little difference in percentage of germination when this slide was compared with one prepared without the boric acid. Valencia (5) states that lactoflavin (natural product) and ascorbic acid have been found to have a stimulating effect upon tube growth of certain pollen types. Auxins and manganese sulfate are also necessary for tube growth.

Vasil (4), when working with pollen grains of the cereals, found atrophy of anthers in boron-deficient plants, although the ovule and surrounding tissues were not affected. He thought that the stimulation of tube growth by the boron was due to a sugar-borate complex which increased the oxygen uptake and promoted synthesis of pectic material for the wall of growing pollen tubes.

When scanning a seeded slide after a few hours of germination, one can usually observe several different stages of development: (1) tip of

pollen tube just protruding; (2) tube fully emerged; (3) no germination but plump grain; (4) burst grain, extruding an irregular mass of cytoplasm; (5) grain has germinated and extruded cytoplasm leaving the empty shell behind; (6) empty grains devoid of cytoplasm when shed from anther. Rarely will all grains be at the same stage of development. The same observations were made with pollen grains planted on daffodil stigmas.

During the testing of pollen grains for viability the writer noted that when the grains were seeded rather heavily, more germinated than when a slide was seeded sparsely. Grains that were a distance from other grains were often plump with cytoplasm but ungerminated. This might indicate that mutual stimulation is a factor in germination. Visser (8) using pear pollen grains made extracts from both live and dead grains. When this extract was added to the stigma along with a small number of fresh live grains, tube growth was promoted. It was found that pollen-grain stimulation is specific; one type mixed with another had no effect. The addition of boric acid was found to increase mutual stimulation.

Miki-Hirosige (4) reported that pollen grains of *Narcissus tazetta* showed positive tropism to stigma, style, ovary, and ovule. Sections of

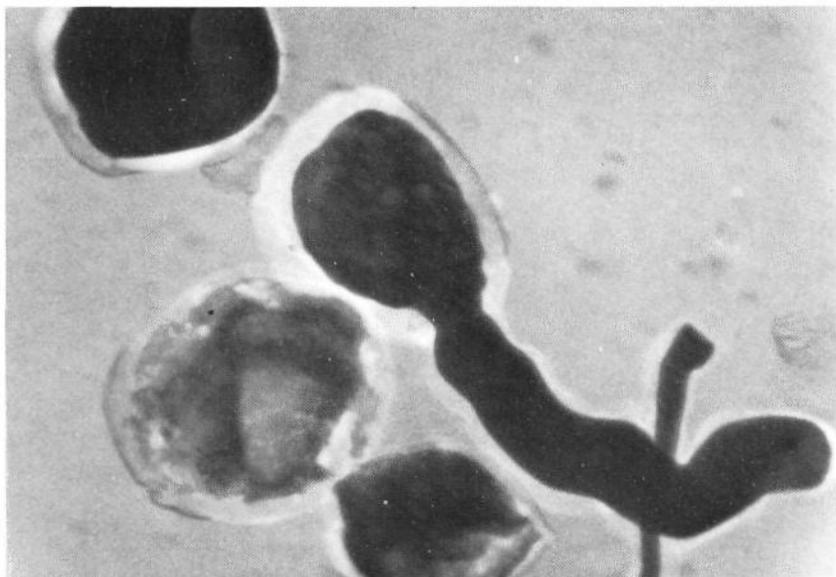


*Narcissus jonquilla* pollen grains after 12 hours on a gelatin medium. Mutual stimulation is clearly evident with large number of grains which have germinated. Two grains in lower right corner do not touch another grain and are ungerminated. 200x, 10-second exposure.

each were planted on agar and when the pollen was dusted nearby it grew toward the sections. He determined that a certain active substance in the pistil draws the growing tubes toward it. Rosen (4) found lily pollen grains chemotropically active to gibberellic acid. When it was used, four times as many tubes penetrated the test wall as the control wall. Michlis and Mascarenkas (4) reported that calcium is chemotropically active for narcissus pollen grains. This author noted that when daffodil pollen grains were planted on the stigma, they always grew directly toward the stigma with no twisting or curling, but when planted on a gelatin medium the tubes meandered as if in search of an object. Often they were twisted and curled.

### METHOD OF TESTING POLLEN

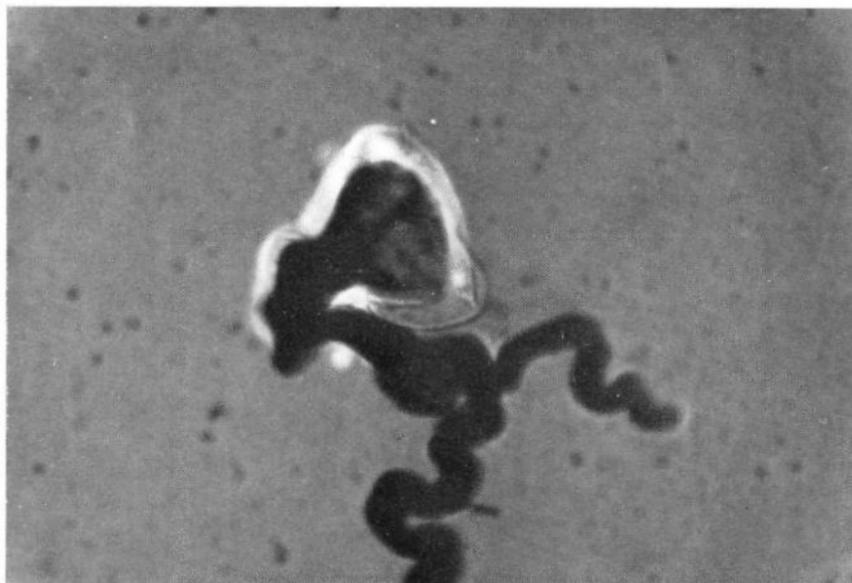
The testing of daffodil pollen grains for viability is a simple procedure. One can decide immediately whether they are worth using by a test for morphological perfection of the grains. The following procedure may be used: a drop of stain-fixative prepared from equal parts (12.5cc) lactic acid, phenol, glycerin, and water mixed with .25 gm of cotton blue is placed on a slide; a few grains are dusted into the fluid and allowed to stand a minute or two. Then the cover glass is applied and the slide is ready to view. The grains which are morphologically perfect are well



Hathon pollen grains — germination on gelatin medium for 12 hours. Exine shows isotropic effect. Membrane that covers tube also shows light transmission. 430x, 5-second exposure.

expanded and stain a brilliant blue; those which have no living cell contents are colorless and consist of a shiny exine, and most are shriveled. If the pollen grains are dusted lightly on the slide the number can be counted, and in this way one may arrive at the percentage which may germinate if given the opportunity with suitable temperature and moisture. The fact that a grain is morphologically perfect does not mean it will germinate. The seeding of a sample with a large number of morphologically perfect grains may be disappointing when observed for tube growth after several hours.

A suitable medium for germinating pollen grains may be prepared in the following manner: 2% gelatin, 5% granulated cane sugar, and 93% water mixed together and brought to a boil, then stored in a sterile jar in the refrigerator. If kept sterile it will last through the entire season free from fungal growth. A small amount of the gelatin solution is placed on a heated slide. As soon as the gelatin preparation has melted and cooled to form a thin layer on the slide, a small camel's hair brush loaded with pollen grains is brushed lightly over the gelatin. Too many grains make counting of the various stages of germination difficult, so it is better to seed lightly if the purpose necessitates calculation of percentage of grains which have germinated. The seeded slide is



Cutty Sark pollen grains germinated for 12 hours on gelatin medium. Tube has germinated, forming several bulbous projections combined with splitting. Isotropic effect of exine is clearly evident. 430x, 20-second exposure.

placed medium side down over a wetted blotter in the bottom of a plastic box. The blotter should not be too wet, as excess moisture may cause the grains to rupture. The slides must not touch the blotter and are suspended over it by propping their end on glass rods. The cover is placed on the box, and the box is kept at room temperature, about 70° to 75° F. Germination will take place at both higher and lower temperatures. Valencia (5) reported good germination of evening primrose (*Oenothera*) at 15° to 29° C. (59° to 84° F.). After the desired length of time the slide is removed and a small drop of the stain-fixing solution is placed on the area where the pollen grains were dusted on the medium. A cover glass is placed over the area and the grains are ready to observe under the microscope. Care must be used to avoid pressure on the cover glass, which may rupture the grains.

Fresh pollen grains may be ready for observation in 30 minutes, as tubes may be forming when collected; some samples may take 4, 6, or 8 hours. Twelve hours is usually sufficient to produce long tubes, twisted and curled around each other, and in 24 hours a mass of empty exines and long tubes entwined about them will be visible.

When fresh pollen grains are used the percentage of germination does not increase after the 12-hour period. With frozen pollen grains it may take as long as 14 hours for germination to begin.

It is impossible to observe every grain that may be germinating. Some may have the furrow side down against the slide, thus under the grain, and these do not show. It is much easier to count the grains which have germinated if the work is done before the tubes become too long.

Pollen grains of the following jonquil hybrids and species have been tested by the author for percentage of germination. In the instances where no viable grains were found the test was repeated for 2 consecutive years, except for new introductions. No viable grains were found.

### JONQUILLA HYBRIDS TESTED FOR VIABILITY OF POLLEN GRAINS

Variety	<i>Morphologically</i>			
	<i>perfect</i> ungerminated (percent)	Germinated (percent)	Burst (percent)	Exines (percent)
Alpine .....	0.0	5.5	0.0	94.5
Aurelia .....	1.3	1.4	0.0	97.3
Baby Moon .....	63.3	21.4	0.0	14.3
Baby Star .....	50.7	41.0	0.0	8.3
Bebop .....	10.0	0.0	0.0	90.0
Bobbysoxer .....	0.0	1.0	0.0	99.0
Boforla .....	0.0	20.0	2.0	78.0
Bolton .....	2.5	2.5	0.0	95.0

<i>Variety</i>	<i>Morphologically perfect ungerminated (percent)</i>	<i>Germinated (percent)</i>	<i>Burst (percent)</i>	<i>Exines (percent)</i>
Bunting .....	2.1	9.9	0.0	88.0
Buttercup .....	21.6	2.0	0.0	76.4
Chat .....	0.0	5.0	0.0	95.0
Chérie .....	0.0	3.4	0.0	96.6
Chevy Chase .....	2.0	4.0	0.0	94.0
Cheyenne .....	7.0	2.0	0.0	91.0
Cora Ann .....	0.0	0.0	0.0	100.0
Cutty Sark .....	12.0	4.8	1.6	81.6
Dainty Miss .....	0.0	0.0	0.0	100.0
Demure .....	3.0	0.0	0.0	97.0
Dove .....	0.0	0.0	0.0	100.0
Dickcissel .....	3.0	5.0	8.0	84.0
Divertimento .....	5.0	10.0	8.0	77.0
Eland .....	0.0	0.0	0.0	100.0
Finch .....	4.0	4.0	2.0	90.0
Flicker .....	0.9	6.2	0.1	92.8
General Pershing .....	19.2	24.2	5.7	50.9
Golden Goblet .....	0.0	0.0	0.0	100.0
Golden Incense .....	4.7	2.3	0.7	92.3
Golden Sceptre .....	14.6	36.0	3.6	45.8
Goldilocks .....	2.1	2.1	0.0	95.8
Hathor .....	9.7	21.0	0.0	69.3
Happy End .....	0.5	3.0	0.0	96.5
Hesla .....	3.5	0.4	0.0	96.1
Kasota .....	13.5	3.0	1.5	82.0
Kidling .....	38.2	47.2	1.4	13.2
Kinglet .....	0.0	0.0	0.0	100.0
La Belle .....	17.1	15.7	0.0	67.2
Lady Hillingdon .....	0.6	1.2	0.0	98.2
Lintie .....	10.6	7.6	3.1	78.7
Lanarth .....	8.0	6.0	0.6	85.4
Mountjoy .....	2.0	3.0	0.0	95.0
Nancegollan .....	22.4	15.5	2.5	59.6
Nirvana .....	1.5	1.5	0.7	96.3
Ocean Spray .....	14.2	7.5	2.5	75.8
Orange Queen .....	14.2	0.0	0.0	85.8
Oryx .....	0.0	0.0	0.0	100.0
Parcpat .....	15.7	20.5	2.4	61.4
Penpol .....	1.2	3.7	0.6	94.5
Pet Finch (Goldfinch) ..	0.0	0.0	0.0	100.0
Pin Money .....	3.0	11.0	1.0	85.0
Pipers Barn .....	8.2	5.0	0.6	86.0
Pipit .....	10.4	5.4	0.0	84.2
Pixie .....	0.0	0.0	0.0	100.0
Polnesk .....	3.6	1.6	0.9	93.9

<i>Variety</i>	<i>Morphologically perfect ungerminated (percent)</i>	<i>Germinated (percent)</i>	<i>Burst (percent)</i>	<i>Exines (percent)</i>
Powell #36 .....	7.0	8.0	2.0	83.0
Prisk .....	4.4	2.8	0.0	92.8
Pueblo .....	9.0	5.0	0.0	86.0
Ripple .....	13.0	25.0	1.0	61.0
Sea Gift .....	10.0	40.0	10.0	40.0
Shah .....	21.0	21.6	0.6	56.8
Sierra Gold .....	5.6	9.1	1.3	84.0
Skylon .....	16.1	10.3	0.0	73.6
Snow Bunting .....	5.4	0.0	0.0	94.6
Solleret .....	16.5	27.8	0.0	55.7
Stafford .....	0.0	0.0	0.0	100.0
Stratosphere .....	19.0	14.0	1.0	66.0
Sugarbush .....	6.9	2.5	0.0	90.6
Sundial .....	1.0	0.0	0.0	99.0
Sun Disc .....	12.0	3.0	0.0	85.0
Suzy .....	23.5	17.9	1.8	56.8
Sweetness .....	4.4	4.4	0.0	90.2
Sweet Pepper .....	12.0	2.0	0.0	86.0
Tittle Tattle .....	13.1	1.4	0.0	85.5
Trevithian .....	19.4	8.3	5.5	66.8
Trim .....	6.0	4.8	2.4	86.8
Verdin .....	22.0	3.0	0.0	75.0
Vireo .....	17.9	2.6	0.0	79.5
Veery .....	5.0	2.0	0.0	93.0
Waterperry .....	9.0	12.0	0.0	79.0
White Wedgwood .....	50.0	0.0	0.0	50.0
Zanita .....	7.3	18.7	0.0	74.0

### SPECIES, WILD FORMS, AND WILD HYBRIDS

<i>calcicola</i> .....	77.0	23.0	0.0	0.0
<i>fernandesii</i> .....	84.6	14.8	0.0	0.6
× <i>gracilis</i> .....	0.0	0.0	0.0	100.0
<i>jonquilla</i> .....	0.8	84.0	0.0	15.2
<i>jonquilla</i> , var. <i>minor</i> .....	11.3	0.0	0.0	88.7
<i>juncifolius</i> .....	11.7	59.0	0.9	28.4
<i>rupicola</i> .....	3.9	90.6	0.0	5.5
<i>scaberulus</i> .....	35.0	43.0	11.0	11.0
× <i>tenuior</i> .....	2.6	0.0	0.0	97.4
<i>viridiflorus</i> .....	25.0	68.0	0.0	7.0
<i>watieri</i> .....	5.1	89.7	2.6	2.6

## CONCLUSIONS

From literature available on work done with angiosperm pollen grains of flowering plants and from the author's observations with daffodil pollen grains, one may conclude:

1. Forms of the species *N. jonquilla* have a larger number of viable pollen grains than most of the hybrids. They should make good pollen parents. Baby Star, Kidling, and Sea Gift might also be used as pollen parents.
2. Better germination was observed when pollen grains were close together. This indicates the use of large amounts of pollen when hybridizing.
3. If pollen grains are stored for a period of time, frozen grains give better germination than those that have been air dried and kept at room temperature.
4. A small amount of boric acid 100 ppm applied to the stigma before pollinating, may stimulate pollen tube growth and improve seed set.
5. Pollen grains stored at room temperature for a long period of time may show morphologically perfect grains, but little or no germination of tubes, and if tubes do form they may be too short to be effective in reaching the ovule.
6. Pollen may not germinate well in continued rainy weather because of bursting of grains as a result of osmotic pressure. Other conditions being proper, grains of fresh pollen germinate rather quickly. Pollinating is more likely to give good results if done under fairly dry conditions, at least a few hours before a rain or shortly after.
7. The chromosome number is an important factor in fertilization.
8. Condition of both the pollen and seed parents is of importance. Temperature, humidity, and age of blooms are all factors influencing fertilization and seed set.

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## DAFFODILS IN NORTHERN IRELAND

By MARY AND WELLS KNIERIM, *Cleveland, Ohio*

The RHS Daffodil and Tulip Year Book regularly includes reports of daffodil shows in Australia, Tasmania, New Zealand, and the United States, but strangely does not include reports on shows in Northern Ireland, where the British flag is flown. This situation may change, since this spring Mr. W. A. Noton, President of The Daffodil Society, exhibited at the Eighth Annual Show of the Omagh and District Horticultural Society. He won best of show with a beautiful 2c seedling and was guest of honor speaker at the Daffodil Dinner following the show, which was attended by more than a hundred enthusiastic daffodil people in the area.

While we were at the London daffodil shows, both Mr. W. J. Dunlop and Mr. N. P. Harrison invited us to come to Northern Ireland and see the show at Omagh on May 2, 1970. Omagh is only a few hours' drive on good roads from the Belfast airport and lies at the foot of the beautiful Sperrin Mountains. After lodging for the night in the old stone Knock-Na-Moe Castle Hotel, and having a sturdy Irish breakfast, we located the Omagh New Technical College where the show was being staged, and asked for Mr. Brian Duncan, who is a member of ADS. We immediately were welcomed as honored guests and began a most enjoyable and interesting visit with a very enthusiastic and friendly group of daffodil people. Brian, an amateur grower, was show secretary and the most successful exhibitor, winning the highest points in the open classes and most of the major collection trophies. His collection of 12 varieties, one bloom each, included Golden Rapture, Whitehead, Craigyarwarren, Empress of Ireland, Rockall, Border Chief, Verona,



Mr. and Mrs. Brian Duncan and daughter at Omagh Show

Banbridge, Vulcan, Norval, Court Martial, and Aircastle. However, Mr. Noton's second-place collection included a perfectly formed 2c, seedling 2212, which was chosen best in show. This collection also included a number of stunning seedlings raised by the late Mr. F. E. Board.

Mr. Harrison's Ballydorn Bulb Farm entry included three of his own introductions: Churchman, a crystal-white 2c which has been a winner at the London shows; Fairmile, a 3b with an orange rim and a green throat; Tullycore, a pink 2b with a green eye; and five of his seedlings under number. These named varieties will bloom in Ohio next Spring. As in the London show, the pink cyclamineus, Foundling, introduced by Carncairn Daffodils Ltd., of Broughshane, was the eye catcher of the show. That one will also bloom in Ohio in 1971, along with Coolgreany, 2b and Churchfield, 2c, a couple of green-eyed beauties from Carncairn.

Entries in the seedling classes were outstanding, including specimens raised by Ballydorn, Carncairn, Mr. T. Bloomer of Ballymena, and Brian Duncan. My guess is that these raisers will continue the excellent work with white daffodils made world famous by their late countryman, Guy Wilson. They seem to do well in raising green-eyed 3b's and pinks. They also have crosses coming along to produce other pink-cupped cyclamineus, hoping to improve on Foundling. Mr. Bloomer's White Star, a perfectly formed 1c which we saw at the late London show, will be a fierce competitor to Vigil. Marie Bozievich noted this same variety at the Ballymena show near Broughshane a day before the Omagh show.

The Daffodil Dinner at the Knock-Na-Moe Castle Hotel following the show was a gala affair with more than a hundred happy daffodil people enjoying the sherry reception and a fine dinner of scampi Mornay, lamb cutlets, and coupe Jacques. His Grace the Duke of Abercorn, patron of the Omagh Society, a neophyte on daffodils but a world expert on trees, was a most charming host. After toasts to the Queen, the guests, and judges, Dr. H. Watson told amusing stories about Protestants and Catholics and we were entertained by an excellent Irish baritone who sang, in addition to traditional Irish songs, a specially prepared song, one stanza of which was:

"The Protestants they have a hard job to do

Raising a daffodil red, white, and blue.

For the Catholics it's easy for so we are told

Already we've got them in green, white, and gold."

After the visit to Omagh, we had intended to drive up to the north coast and see the famous *Giant's Causeway* and the *Antrim coast line*. However, the Omagh program included a daffodil tour on Sunday which we could not resist. Leaving Knock-Na-Moe at 10:00 a.m. we drove up the slopes of Sperrin Mountains to Mountfield Lodge Gardens, the home of Gen. and Mrs. D. G. Moore, whose interests are forestry and daffodils. Their home looks down on a long steep grassy slope with huge naturalized daffodil plantings on each side. Then, driving along the foothills of the mountains we reached Ballymena for lunch and on to Dunrobin Bulb Farm. Here Willie Dunlop grows the beautiful 1b's Ballygarvey, Newcastle, and Downpatrick, and numerous other well known varieties in long rows as we grow corn in the Midwest. Then to Carncairn Daffodils, Ltd. in nearby Broughshane; here we saw Mrs. Reade's beautiful, neatly-maintained beds of daffodils on a long slope. Foundling and other new seedlings and varieties were at peak of bloom. After Carncairn, the tour went to Rathowen in Ballymena



Daffodils at Carncairn Daffodils, Ltd.

*Photographs by Wells Knierim*

to see the new seedlings of Mr. T. Bloomer, growing in raised beds. There were the seedlings "whiter than white" by the "man with the silken white hair," as the Omagh dinner song had promised.

The tour was to end with tea at Ballymena, but Mr. and Mrs. Harrison kindly took us in tow for dinner at the beautiful Dunadry Inn (near the Belfast Airport) and then down to their charming home near Killinchy on the shores of Strangford Lough.

After an interesting evening talking daffodils with Mr. and Mrs. Harrison and Mr. M. J. Ward, their other guest from Dublin, we looked at their daffodils overlooking the dorn with several whitewashed, thatch-roofed cottages in the distance. The Harrisons, as other Northern Ireland growers, provide no protection against wind and inclement weather. Their aim is to produce weather-resistant flowers for good garden as well as show use. And it is good to know that these beautiful daffodils from the famous Broughshane land will soon find their place in many parts of the world as did those of Mr. Guy Wilson. The quality of the daffodils in Northern Ireland is only exceeded by the friendliness and hospitality of the daffodil people there.

Mr. Duncan has since written that we should encourage American daffodil tourists to include Omagh in their itineraries and let him know in advance of their plans so he can arrange to include them in their program and activities. If you go, you will never forget the daffodils, the mountains, the coastline and most of all, the enthusiastic, friendly daffodil people of Northern Ireland.

# MUSINGS AND MEANDERINGS

By POETICUS

Daffodil enthusiasts are going abroad in increasing numbers, bringing back with them slides and reports of the London shows, of new varieties in the offing, of the fields of daffodils in Holland, Lincolnshire, and Cornwall, of the species in the mountains of Spain and Portugal, and of the bold displays of daffodils and tulips at Keukenhof. But no one seems to have sought out the region in England where the Lent Lily, *N. pseudo-narcissus*, grows wild, carpeting valley floors, climbing the slopes, and spilling over into distant fields and woods. This, in the judgment of that peripatetic naturalist, Edwin Way Teale, is one of the most memorable floral sights he has encountered in his years of travel and was one of his goals — the only one as far as daffodils were concerned — in the course of a recent tour of the English countryside, of which he writes in the book "Springtime in Britain," published this year.

The region taken over by the Lent Lily lies between the Severn and Wye Rivers and north of the Forest of Dean, a large tract west of London near the border of Wales. The flowers are to be seen in profusion along the Wye from Monmouth to Ross, then across lower Herefordshire and into the upper part of Gloucestershire, the greatest concentration being between Dymock and Newent in Gloucestershire. Here they grow in fields and open woods in solid patches occasionally as large as 40 acres.

Nature grows daffodils in her own bountiful and irreverent ways and it might be well if her results were recorded on film since, in some cases, where profit will not stop short of extinction, time may be running out.

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With the atomic bomb, the ABM missile, and supersonic airplanes as a few of their gifts to enhance the quality of life which perversely seems headed in the other direction, the scientific and technological fraternity have turned their attention to making plants yield their secrets and perform on demand. The press and television happily cooperate in spreading the word of their findings and it should be obvious that a major breakthrough is close at hand, although in just which direction is still not clear.

It has been proved to the experimenter's satisfaction that if you connect a plant to a meter and entertain critical thoughts about the plant, it will feel acute distress which will be registered by violent fluctuations of the needle. In another demonstration of the sensitivity of plants, Dr. George Milstein of the Brooklyn Botanic Garden has discovered that plants respond to ultrasonic sound and has produced a long-playing record entitled "Music to Grow On" which will achieve remarkable results if it is played 17 hours a day.

However, a doctorate or even a baccalaureate is not essential to success in bringing plants to heel. After Edward H. Torbeck retired as a barber in St. Louis he planted a floral design in his front lawn of an American flag with "God Bless America" as a caption and found that by watering the display twice a month with a solution of one quart of beer to ten gallons of water he got spectacular results. Probably the flag waves and bombs burst. Certainly the beer company which urges you to KEEP AMERICA CLEAN while it floods the country with no-return glass bottles and indestructible aluminum cans is happy.

A stranger case with better credentials concerns a group at the Mt. Washington Church in Baltimore which directed five minutes of intensive prayer toward a plant in the possession of a scientist in Atlanta, Dr. Robert Miller. Carefully controlled measurements showed that twelve hours after the five-minute period of prayer the plant was growing 8.4 times as fast as it had previously.

However, the most promising advance we have heard are the gratifying results achieved by growing plants in moon dust, and along with those who have booked passage to the moon we have placed an order with our local hardware store for an 80-lb. bag of moon dust.

The mystery of life leaves its imprint on every true gardener and doubtless the revelations of this generation only nibble at the core, but before we press on in search of the ultimate, may we hope that some other venturesome spirit will rediscover and proclaim what we tend to forget in our quest for bizarre answers: that proper proportions of air, light, soil, water, and heat still work wonders in the development of plants, including daffodils.

## HARTFORD AND THE 1971 CONVENTION

Come to the Convention in Hartford and make it your stepping stone for visiting this part of the country. Hartford, founded in 1639, is the capital of Connecticut. It is almost in the center of the state, equidistant from New York and Boston, and is conveniently reached by Interstate Highways 84 and 91 by car, or by air to Bradley International Field.

It is a city of great contrasts in architecture and has many points of interest. Headquarters at the Hotel Sonesta are located in an outstanding redevelopment area in the heart of the city, Constitution Plaza. The Old State Capitol building designed by Bulfinch and built in 1796, is nearby. The Wadsworth Atheneum, first built in 1842 and the oldest private museum free to the public in the country, and its noteworthy collections of art and antique furniture is within walking distance. The State Library and the Connecticut Historical Society are treasure-houses of information for anyone interested in genealogy. In the Insurance Capital of the World, the head office buildings are impressive. Church architecture varies from the colonial of the Center and South Congregational Churches downtown to the rebuilt modern St. Joseph's Cathedral, the Unitarian Church, the Greek Orthodox Church, and many others, including handsome synagogues. The homes of Mark Twain and Harriet Beecher Stowe may be visited. In West Hartford is located the Noah Webster house and the Planetarium of the Children's Museum, one of the newest in the country. The Hillstead Museum, a house with furnishings of the late 19th century, is in nearby Farmington, and in Wethersfield are the Buttolph-Williams house, built in 1692, and the Webb, Stevens, and Deane houses. Washington planned the Yorktown campaign at the Webb house, now beautifully restored and filled with period furnishings.

If you come early or linger, day trips can be taken to the Mystic Museum, a reconstructed village devoted to the whaling industry, or to Old Sturbridge. An overnight trip can be made to Old Deerfield. Yale University in New Haven, with its fabulous new Beinecke Library and other museums, is only an hour away. Boston with its world-renowned Arnold Arboretum and Harvard's Peabody Museum with its incomparable collection of glass flowers is about two hours away.

Avid gardeners should visit the Old Store of Comstock, Ferre & Company in Wethersfield; this store was founded in 1820. Brimfield Nurseries in Wethersfield is the home of unusual trees and shrubs. White Flower Farm, comparable to Wayside Gardens, is in the town of Litchfield, a beautiful New England village where Tapping Reeve started the first law school in the United States not associated with a college or university. The New York Botanical Garden and the Brooklyn Botanical Garden can be visited on a stopover in New York.

As chairmen of the 1971 Convention we extend a warm invitation to all members to join us, to enjoy the pleasure of seeing old friends and making new ones, to experience an interesting time in Hartford, and to see a lovely and different part of the country.

— AMY AND CHUCK ANTHONY

## HYBRIDIZERS' FORUM

### *Seed Distribution Program*

The 1970 ADS seed distribution program placed daffodil seeds and/or 2-year-old bulblets in the hands of 32 members. Seeds went out to 16 states and 2 countries outside the U.S. The hybridizing handiwork of Matthew Fowlds and Charles W. Culpepper will be tested in such varying climates as Alabama and Mississippi in the south, and Minnesota in the north. Some have been planted in California, Oregon and Washington; others in Florida, Massachusetts, and Connecticut. The seeds will also be tested at opposite ends of the world — in Nova Scotia and New Zealand. It is interesting to think that the wide range of ecological conditions provided to these seeds may enable new daffodils to develop that happen to be genetically suited to their birthplace. A plant that grows ideally in one area can be a disappointment in another; the spindly seedling of one area that dies before reaching maturity could be developed into a vigorous beauty in another area.

Several years ago 2-year-old bulblets of Mr. Culpepper's hybridizing were distributed and many of these are now full-grown daffodils and commanding attention. At the Tidewater Daffodil Show in Newport News, Virginia, this year Polly Brooks of Richmond, Virginia, won the ADS Rose Ribbon with a child of Spellbinder. Mrs. Walter Margerson of Lexington, Kentucky, won the ADS Rose Ribbon at the Kentucky State Daffodil Show with another Culpepper seedling. Mrs. Marvin V. Andersen of Wilmington, Delaware, exhibited a Culpepper seedling of eye-popping beauty at the Berwyn, Pennsylvania, Daffodil Show this spring. Many Culpepper seedlings showed up in regular classes at other shows. In a few more years they will be joined by the children of Mr. Fowlds' cyclamineus-trumpet crosses.

— WILLIAM O. TICKNOR

### *From the Seed Broker's Mail*

As a recipient of seeds for 1969 from the ADS, and living so far from the original surroundings of their breeding, I felt that you may be interested in hearing how the seed have fared over the past 12 months. Seeds were

received in July 1969, and they were planted immediately. A number germinated and grew on until December — others did not show any signs of life.

The most prolific — and I have a veritable forest of this type — is Culpepper's February Bicolor cross. The Roman Candle  $\times$  Accent seeds have also proven fertile, as have Mr. Fowlds' cyclamineus strain. Next in line would be Murray Evans' L-30  $\times$  K-44, Festivity  $\times$  White Gold, and Butterscotch  $\times$  Golden Day. Of the remainder I have only some 6-12 seedlings showing up at present, but no doubt there will be others coming up later. At least I have some of each cross and a number are showing two leaves, this making them 2-year bulbs this season.

— LONNA HYMUS, *West Australia*

What a thrill to receive the four packets of Culpepper and Fowlds seeds! You have opened up a new avenue of pleasure and expectation to me. I have never grown daffodils from seeds — though I have done a small amount of iris hybridizing. All of these crosses sound marvellous — especially the Fowlds cyclamineus strain.

— LOIS HUMPHREY, *California*

#### *Notes on Some Carlton Seedlings*

Reading Dr. Throckmorton's comments on Carlton in the March 1970 issue prompted me to take a closer look at a batch of Carlton seedlings to which I had not paid much attention, other than noting that none of them seemed to deserve a name. As he said, Carlton is a very important commercial variety, registered by P. D. Williams over 40 years ago, a big 2a of great vigor, good crop, bright yellow with a frilled cup. In 1959 I gathered about 80 seeds of Carlton open-pollinated, from a row which was in easy bee-flight from at least 300 other assorted varieties in bloom. 1959 was a vintage year for seed setting here. Nearly all of the seeds sprouted and grew, but some were lost in a flood that inundated my seedling beds. About 30 remained to bloom.

All were vigorous husky plants which bloomed fairly early in life. They have remained where they were lined out, as I had plenty of room. All have proved free-blooming and good increasers, with blooms large and strong-stemmed like their seed parent. Every one of them is a yellow 2a. They all differ from Carlton in having more pointed perianth segments, and in color, the perianths all being of a somewhat duller and deeper yellow, and the cup a luminous lemon which is very striking and of great carrying power. All of them have a much more pronounced frill on the cup than Carlton, and no two are alike in the amount or extent; in some it is pleated and scalloped a great deal, in some it is symmetrical, in others not. Only one has the preciseness required of a show bloom, and it is no better than a couple of dozen other 2a's I have grown.

One who did not know the origin of these plants could logically assume that all came from the selfsame controlled cross, but since actually all came from Carlton open-pollinated, it seems to me the only logical conclusion is that at least in 1959 Carlton was a potent self-pollinator whose progeny cannot be explained otherwise. It also suggests to me that Carlton's genetic background is quite homozygous; in simpler English, its ancestors must have been much alike with perhaps one side of the family possessing more frills and somewhat different shades of yellow in its color scheme.

— VENICE BRINK

# BULLETIN BOARD

## FROM THE PRESIDENT

Dear ADS Members:

I have had the privilege and pleasure, during the past year, of meeting and hearing from many of you. The warmth and friendliness of ADS members has made this job of being president very pleasant and enjoyable.

I urgently invite suggestions from you as to new services and improvement of existing services and also suggestions for expanding the interest in daffodils within the membership of ADS and throughout all our country — particularly among young people.

Please remember a membership in ADS makes a nice Christmas gift and costs only \$5.00. You may ask to have the membership card sent to you and give it personally to the new member if you wish.

Have you told Santa Claus you would like a trip to Hartford to the Convention next spring? I hope you have and I'll be looking forward to seeing you.

Since I cannot send Christmas wishes to you individually, may I take this opportunity to wish you a very happy holiday season.

Cordially,

WALTER E. THOMPSON

## FROM THE EXECUTIVE DIRECTOR

Behind the bare names and addresses listed in the ADS roster are many stories of personal achievement, most of which escape our probing eye, but a trio have recently surfaced which cannot go unheeded. Oddly, they all concern members living in the Midwest Region.

For the first time in its long history, an issue of the *Journal* of the Indiana Medical Society has been dedicated to an individual, Dr. Goethe Link of Martinsville, Ind. His long life and unflagging curiosity have led him into such disparate fields as astronomy, herpetology, ballooning, ornithology, gemmology, and, of course, medicine and surgery in which he has brought about many advances and set many records. In the issue of the *Journal* leaders and associates of Dr. Link from the many fields which his life has touched pay tributes to his accomplishments and, with one exception, all attended a dinner in his honor in Indianapolis.

Forty-five years ago Mr. and Mrs. Stanley M. Rowe acquired 200 acres 15 miles east of Cincinnati and found themselves on a path which led to the creation of an arboretum where a wide variety of plants can be seen which will grow in their area. Their journey has led to a collection of 2,000 trees and shrubs, wild flowers and bulbs by the thousand, and the welcome appearance of classes of school children, young homemakers, garden clubbers, and beauty-lovers in general. The story of their successful private arboretum which is always open to the public is recounted by Mrs. Rowe, an ADS member, in the summer, 1970, issue of the *American Horticultural Magazine*.

Those who attended the meeting of the directors in Cincinnati in the fall of 1969 will recall the luncheon and business session at the Garden Center of Greater Cincinnati. Daffodils should now have the attention they deserve in the activities of that organization with the appointment of Mrs. Neil (Peggy) Macneale as director of horticulture at the Center. Mrs. Macneale holds the degree of bachelor of landscape architecture from Smith College and a graduate degree from the School of Landscape Architecture at Harvard.

\* \* \*

While publication date is rather erratic, by the time this appears in print the 1971 *Daffodil and Tulip Year Book* should be available. We have recently received notice of an increase in price which will require us to charge \$5.50, postpaid.

In the past membership renewal notices have been sent to all members, even though their dues were paid well in advance and the notice so stated, just to permit these members to order any publications they might desire, especially annual ones such as the R.H.S. *Year Book*. As an economy measure and because these notices confuse many members into believing that their memberships are about to expire, notices will be sent hereafter only to those whose memberships are, in fact, about to expire. As a result, members in good standing will receive no reminder, other than this paragraph, to place orders for year books, binders, and other publications or supplies. A list of them will be found on the back cover of this issue of the Journal.

\* \* \*

One of our members is anxious to obtain a bulb of Dick Turpin, a 3b introduced by A. M. Wilson in 1930. If anyone is still growing this variety, the office will be glad to put the parties in touch with each other.

\* \* \*

At this time we pause to say that our days and work are made lighter by the many friendly expressions which cross our office desk and often, to our regret, do not otherwise receive the acknowledgment they merit. We are also aware of the forbearance which attends our occasional lapses. May the season and the new year bring each of you the satisfactions you seek and the rewards you deserve.

GEORGE S. LEE, JR.

## FALL BOARD MEETING

Forty ADS directors and their guests attended the fall board meeting held in Wilmington on Saturday, October 10. Mrs. Marvin V. Andersen was our hostess. Dr. and Mrs. Andersen entertained the directors on Friday evening with a buffet supper in their home.

The directors' meeting was held at Longwood Gardens. Written reports were submitted by 6 regional vice presidents and by 14 committee chairmen.

The Society's operating funds are slightly less than at the same time last year. Membership also shows a small decline to the present 1392. Newsletters, as well as the Journal, were felt to be valuable assets.

Westchester County, N. Y. was transferred by repeated request to the New England Region. Show Rules were modified by ruling the new RHS

Division XII as optional in ADS show schedules. The Rose Ribbon Award was discussed and clarified. Recent additions to the miniature list are: la Bagatelle, 1b Lilliput, 5a Doublebois and 3b Paula Cottell. The Public Relations committee has chosen Peeping Tom for its 1971 promotional program thru retail dealers. Newer daffodil varieties are always needed for test gardens as bulbs received are tested on a 3-year basis. The ADS Roster will be printed separately from the Journal in 1971. Two amendments to the bylaws were presented: 1, to include the Executive Director as a member of the Board of Directors, and 2, to create a Junior Membership. Future Conventions are scheduled for: 1971, Hartford, April 29 thru May 1; 1972, Portland, April 5-7; 1973, Williamsburg, dates changed to April 12-14.

At the Saturday evening banquet, Wells Knierim presented his slides of daffodils taken last spring on a trip to England, Ireland and Holland.

MRS. ROBERT F. JOHNSON, *Secretary*

## SHOW RULE CHANGES

The following actions of the Board affect daffodil show rules:

1. Second sentence of the requirements for a Small Show to read:  
"Schedule must include classes for single specimens of standard daffodils in all divisions and subdivisions of RHS Classification, except Division XII (which is optional), and at least one collection of 5 or more different varieties of daffodils."
2. Second sentence of the requirements for a Large Show or State Show to read:  
"Schedule must include classes for single specimens and vases-of-three of standard daffodils in all divisions and subdivisions of RHS Classification except Division XII (which is optional), and at least 5 collections of 5 or more varieties of daffodils."
3. Seedling daffodils in classes for the Rose Ribbon may be entered only by the exhibitor and must be identified by his designated number. (*Exact wording not available.*)

## DAFFODIL SCHOOLS

Daffodil School #1 will be given on April 22 in Columbus, Ohio, under the auspices of the Central Ohio Daffodil Society. The instructors will be Mrs. Harry Wilkie and Wells Knierim. Fee, \$5.00. Chairman, Mrs. Richard Bell, 1083 Wyandotte Road, Columbus, Ohio.

Would-be judges are reminded of the requirements for becoming accredited judges:

1. ADS membership for at least 3 years.
2. Proof of growing 100 or more named varieties of daffodils from at least five divisions.
3. Must have exhibited daffodils for at least 3 years in as many shows.
4. Pass Courses I, II, and III.
5. Judge three shows as a Student under the supervision of an Accredited Judge of ADS.

## ADDITIONS TO APPROVED LIST OF MINIATURES

The following four varieties have been added to the Approved List of Miniatures:

- 1a Bagatelle
- 5a Doublebois
- 1b Lilliput
- 3b Paula Cottell

Interested members are invited to suggest periodically to the chairman varieties which they feel should be considered for addition to our list. The criteria accepted for miniatures should be constantly borne in mind:

1. Is it suitable for the small rock garden?
2. Is it unsuitable for exhibiting in the standard classes?
3. Does it fit in well with the present list?

(Votes should be restricted to varieties personally seen growing in a garden.)

As it is recognized that varieties on the established list should not be subject to review more than once in several years, and as there was a complete review a year ago, it will be some time before opinion will be invited as to the removal of any on the December 1969 list.

JOHN R. LARUS, *Chairman*

## THE YEAR OF PEEPING TOM

The Chinese designate years by the names of animals. They had the Year of the Horse and the Year of the Dog. ADS is borrowing a leaf from their book and designating 1971 as the Year of Peeping Tom.

What does that have to do with you? Most of you grow it, but the number of members of ADS is minuscule compared to the gardening population of the United States. Some other gardeners may know or grow it, but it is safe to say that the vast majority of them do not. 1971 is the year that I should like us to make a special effort to push this one variety. It has a catchy name, an appealing shape, does well in many areas, and is generally available at a modest price.

Will all members, please, display a bouquet with name tag at your local bulb dealer's, in your garden center, at flower shows, in a local library, or any other place where it will be seen by many people? If members will send me the names of local bulb dealers, I will send them a publicity sheet. The names must be received soon, because the envelopes will have to be addressed and the publicity sent out in early spring.

ATTENTION! — Regional vice presidents: Please copy this in your next newsletter. Let's have Peeping Tom peek into hundred of gardens by the spring of 1972. To do this, the groundwork must be done now.

ELEANOR HILL, *Chairman*  
*Publicity and Public Relations*

## **HELP! HELP! ON 1971 SHOW SCHEDULES**

**By Your Awards Chairman**

The volume of work to be handled by the present and past awards chairmen of the Society has been heavy, and in the last 3 years it has increased even more. In order to reduce the number of times each show schedule must be handled, the cooperation of show chairmen, schedule chairmen and other members of ADS approved shows who correspond with the Awards Chairman is earnestly requested.

**First:** Drafts of show schedules should be submitted well in advance of the show date to the Awards Chairman **IN DUPLICATE**. In this manner comments may be written on both copies and one returned to the show committee for final printing. (Drafts submitted in one copy only will be copied for you at a cost of 20 cents per sheet)

**Second:** If your show is to be a State Show or a Regional Show, obtain the approval of your Regional Vice President before you submit your schedule draft and send both together at the same time to the Awards Chairmen. (Forms have been supplied to the Regional Vice Presidents for this purpose.)

**Third:** With the return copy of your schedule you will receive a checklist of things to be done to comply with the Society's requirements for shows offering its awards. Please follow this as closely as possible.

**Fourth:** If you are offering the Watrous and/or Quinn Medals, ask your treasurer to send you the check or checks. A form will be supplied you for this purpose.

**Fifth:** Mail a copy of your **FINAL SCHEDULE** and the check or checks **TOGETHER** to the Awards Chairman in sufficient time for them to be received and the awards mailed to you so that you will have them before show time. Awards will not be mailed until the final schedule and checks (if required) are received by the Awards Chairman.

Every effort has been made to simplify your job. Please help me to simplify mine.

— Franklin D. Seney

# REGISTRATION BLANK

ADS Convention, April 29, 30, and May 1, 1971

Hotel Sonesta, Hartford, Connecticut

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Registration Fee: before April 7 ..... \$45.00  
after April 7 ..... \$50.00

Convention registration includes: April 29 - 10th Annual Daffodil Show and National Convention Show; April 30 - Bus tour of gardens; luncheon; dinner; May 1 - panels; luncheon; banquet.

Make checks payable to Charles P. Britton, 1971 Convention Treasurer  
Mail to: Mrs. Anne B. Taggart, 69 Sunset Farm Road, West Hartford, Conn. 06107

Early registration will greatly assist planning.

Please give Christian or nickname \_\_\_\_\_

## HOTEL RESERVATION

Hotel Sonesta

Constitution Plaza, Hartford, Connecticut 06103

The following flat rates are available until April 7.

\$20.00 Single ( )

\$26.00 Twin ( )

Arrival Date

Time

Departure Date

Time

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

I plan to share a room with: \_\_\_\_\_

No charge for children under 16 sharing room with parents.

Free Parking for Overnight Guests.

AMERICAN DAFFODIL SOCIETY  
April 29, 30, May 1, 1971

\$10 deposit necessary to hold room  
for arrival after 6 p.m.



## SYMPOSIUM

The 1971 Symposium ballot will be printed in the March issue. If your season begins before you receive the Journal, keep the Symposium in mind as your season unfolds. As long as the members, particularly those having long experience and representative collections, evaluate and report, the Symposium should continue to serve as it always has.

ELIZABETH T. CAPEN, *Symposium Chairman*

### 1971 DAFFODIL SHOW DATES

A supplementary list will be published in the March issue of the Journal. Send information before January 10 to the Awards Chairman at 308 Longwood Drive, Newport News, Va. 23606 as follows: date of show; city or town where it will be held; show address or building; sponsor of show; and the name and address of the person to contact for information.

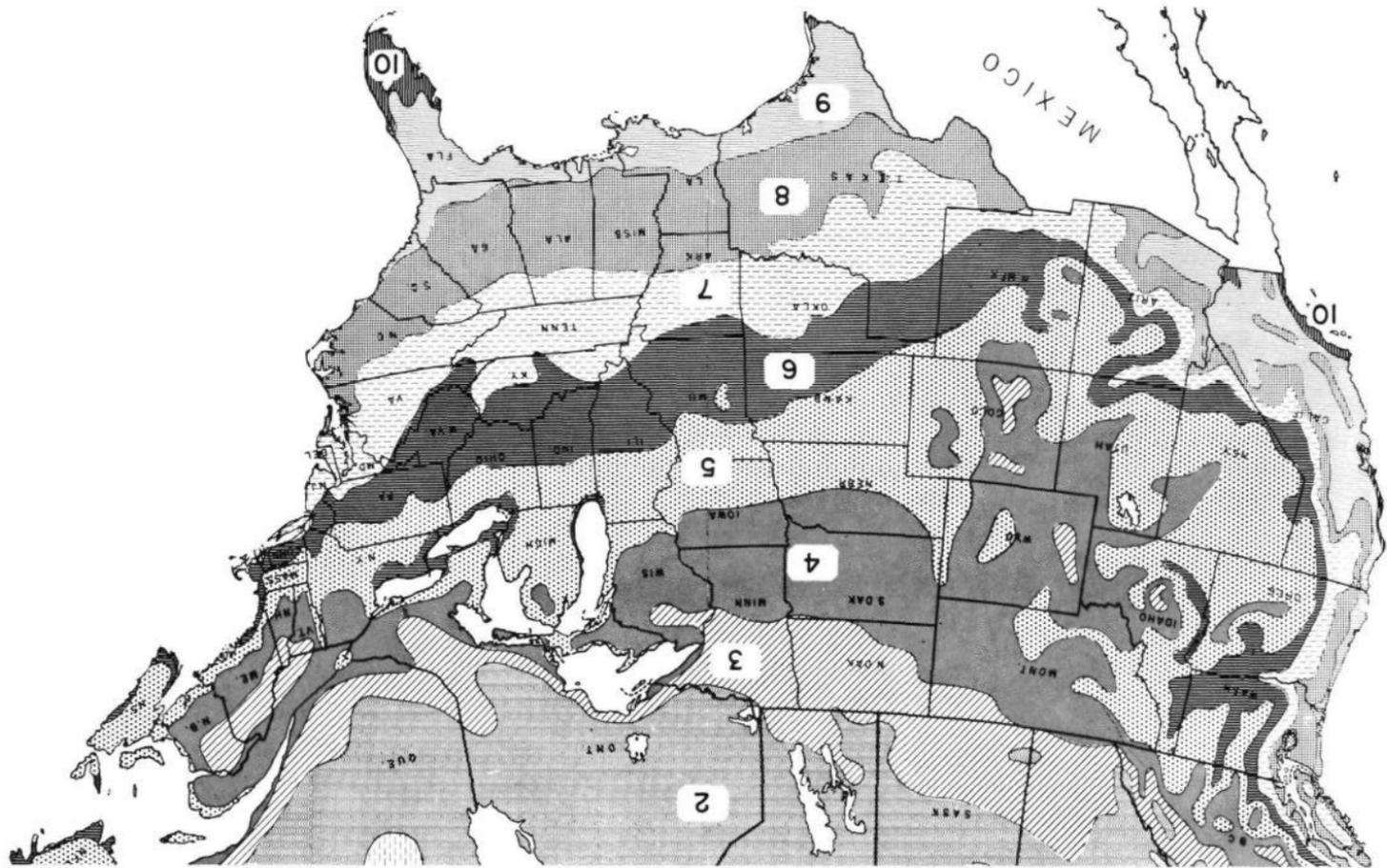
#### *Early Shows:*

- February 27-28 — Santa Barbara, Calif. at the Museum of Natural History; information: William H. Roese, 1945 Hacienda Drive, La Habra, Calif. 90631.
- March 20-21 — La Canada, Calif. — Southern California Daffodil Society show at Descanso Gardens, 1418 Descanso Drive; information: William M. Hesse, 1400 W. Wilshire, Fullerton, Calif. 92633.
- March 27-28 — El Dorado, Ark. — Southwest Regional Show of Arkansas Daffodil Society and El Dorado Garden Club; information: Carl R. Amason, Route 3, Box 180, El Dorado, Ark. 71730.
- April 2 — Hernando, Miss. at the DeSoto County Youth Bldg. by the Garden Study Club of Hernando; information: Mrs. Morris Lee Scott, Route 3, Box 78, Hernando, Miss. 38632.
- April 3-4 — Gloucester, Va. by the Garden Club of Gloucester at Gloucester High School; information: Mrs. Chandler Bates, Gloucester, Va. 23061.
- April 3-4 — Nashville, Tenn. at the new Botanical Hall, Cheekwood, by the Middle Tennessee Daffodil Society; information: Mrs. Phil M. Lee, 6415 Bresslyn Road, Nashville, Tenn. 37205.

#### *Later Shows: (Full information will be given in the March issue.)*

- April 10-11 — Newport News, Va. (Mrs. William A. Hopkins, Jr.)
- April 17-18 — Madisonville, Ky. (Mrs. M. R. Mills)
- April 17 — Chillicothe, Ohio (Mrs. Reginald Blue)
- April 20 — Dayton, Ohio (Mrs. Fred Schuster)
- April 20 — Wilmington, Del. (Mrs. Herman P. Madsen)
- April 23-24 — Norristown, Pa. (Mrs. John D. Siegfried)
- April 24-25 — Cleveland, Ohio (Wells Knierim)
- April 24-25 — Washington, D. C. (Mrs. E. L. Gates)
- April 28-29 — Downingtown, Pa. (Mrs. Leonard Mygatt)
- April 29-30 — Hartford, Conn. — Annual Daffodil Show and National Convention Show sponsored by the Connecticut Horticultural Society, at The Pond House, Elizabeth Park, Asylum Ave.; information: Mrs. Richard G. Willard, 99 Griswold Road, Wethersfield, Conn. 06109.

FRANKLIN D. SENEY



## PLANT HARDINESS ZONES AND DAFFODILS

By MRS. JOHN B. CAPEN, *New Jersey*; and panelists: MRS. RAYMOND L. ROOF, *Kentucky*; MRS. KENNETH B. ANDERSON, *California*; MRS. WALTER E. THOMPSON, *Alabama*; JOHN R. LARUS, *Connecticut*; and CARL R. AMASON, *Arkansas*.

"What We Can Learn From Our ADS Symposium" was the topic of the panel discussion one morning at the Dallas Convention. It was moderated by Mrs. Capen, Symposium Chairman, with panelists from various areas, selected with reference to the Plant Hardiness Map zones rather than Society regions. In her introductory remarks Mrs. Capen pointed out that while the ADS is organized by geographic regions, its members garden by climate zones, which may be defined as areas of similar cold tolerance, determined by the expected minimum winter temperature. Every ADS region includes several climate zones and in one region or another daffodils are grown in seven of the ten zones, from Zone 10, where the coldest nights will reach 35° F., to Zone 4, where the mercury occasionally drops to -25°. In all seven of these zones daffodils grow well, but not all the same ones, the same way, nor at the same time. Panelists used the same list of popular varieties to illustrate their timetables: *N. asturiensis* ("minimus"), February Gold, Kingscourt, Festivity, Tresamble, Geranium, and Frigid.

*(Following are abridged versions of the contributions of the various panelists, with connecting material by the moderator.)*

MRS. CAPEN:

Mrs. Roof represents Zone 7, in which daffodil growing became so popular that the ADS was formed. Centered in the Washington, D.C. area, stretching north to southwestern Connecticut and southwesterly to central Texas, Zone 7, with a winter minimum of zero to 10°, is the home of so many ADS spokesmen that one might get the impression that theirs was the only way to grow daffodils. Mrs. Roof was asked to summarize the "establishment" position in regard to Symposium, culture, and timing, as a point of departure for later speakers.

MRS. ROOF:

Some 200 years ago Kentucky was the Happy Hunting Ground for the Indian. Today Kentucky is the Happy Planting Ground for the daffodil. We can successfully flower practically every daffodil grown to the north of us, except the late, late varieties. We can also flower most daffodils grown to the south of us, except those varieties that bloom at Christmas time, which are too tender for us. We normally have a six-week blooming season, but blooming time for identical varieties can vary as much as 2 weeks. Even though our greatest distance stretches east to west (about five hundred miles) rather

### THE ZONES OF PLANT HARDINESS

Approximate Range of Average Minimum Temperatures, Zones 4-10

Zone 4: -30° to -20° F.

Zone 8: 10° to 20°

Zone 5: -20° to -10°

Zone 9: 20° to 30°

Zone 6: -10° to 0°

Zone 10: 30° to 40°

Zone 7: 0° to 10°

than north to south, we have this variance — and we have a great variety of soils. Beginning in the east with mountains, next we have the Bluegrass country with limestone, the Knobs (little round hills), the western coal fields and the lake-river area in the west with heavy soil. We can have blooms in mid-February, but normally our average blooming season is from the first of March to the middle of April. We expect “minimus” to bloom from February 1 to March 1. February Gold blooms mid to late February, Kings-court late March, Festivity about the first of April. Tresamble blooms in early April, Geranium about the 2nd week in April and Frigid in mid-April.

We plant 4 to 6 inches deep, put a little sand in each hole in the heavy soil in the west for drainage, mulch more for cleanliness and protection from sun than from cold. We fertilize, some still preferring bone meal, others using general fertilizers with low nitrogen content. We replant less and less often, some feeling that they lose more bulbs in summer storage out of the ground than those left in the ground. Disease and rot is becoming more prevalent. Miniatures are not dependable in the open. Good garden flowers seem to be favored over show flowers. Our reverse bicolors have to be replaced too often.

MRS. CAPEN:

Moving from the center to the warmest areas, while daffodils grow handsomely along the Gulf Coast and in the Rio Grande Valley, where they are treated as annuals, the ADS has at present no active membership there. The warmest organized daffodil-growing center is near the southwest coast of California. Mrs. Kenneth B. Anderson presented the situation there, where within a relatively few miles, members are gardening in Zone 10a (35°) to Zone 8b (15°).

MRS. ANDERSON:

The Pacific Coast Region runs the gamut of zones from frost-free tropical areas (10a) in certain coastal areas to deep-freeze areas in the mountains (8b) and every zone in between. It encompasses in Oregon and Washington some of the best daffodil-growing areas in the world, and conversely, some of the worst areas in the hot regions of desert and tropics in southern California, Arizona, etc. In between, we have vast areas in which daffodil growing is possible, but with problems as to varieties which can survive the varying conditions of weather and environment.

California, in the Plant Hardiness Zone map, is loosely divided into zones from 8a (min. temp. 10° - 15°) thru 8b, 9a, 9b, to 10a (min. temp. 30° - 35°.) A University of California plant climate zones map further breaks it down into nine distinct climate areas. Then there are seven major zones established and numbered from the coast inland, and divided into subzones with consistently rising day and night temperatures from the north thru central to the south. Many subzones exist within these larger divisions as temperatures are controlled by physical conformations. Rainfall, while important, is offset by the large amount of irrigation used in most areas, but tends to cause humidity in high-rainfall areas of Washington, Oregon, and northern California, and dryness in southern California, the deserts, and Arizona and Nevada.

Southern California and coastal central California are the main daffodil growing areas in California, comprising low coastal areas, coastal valleys, intermediate valleys and foothill areas. Few growers live in the mountains, mountain valleys, and deserts.

A census taken from a sampling of growers from Oregon, and several areas in California gave the following blooming periods: "Minimus" — late January to March 15th; February Gold — late January to late March; Kingscourt — late February to mid March; Festivity — late February to late March; Tresamble — late March thru April; Geranium — mid March thru April; Frigid — too late to be grown in the south, April-May in the north. These dates presuppose that the bulbs have been down a year or two at least, for newly purchased bulbs tend to bloom considerably later. The earliest blooming dates occurred in the Santa Barbara and San Diego areas, coastal protected areas. The San Francisco and Los Angeles areas had practically the same bloom season, two to three weeks later. Daffodils in northern California and the foothill areas of southern California (in which I live) bloom another two to three weeks later. Last to bloom are in higher areas in northern California, Oregon, and Washington.

The mild winters of southern California are particularly suitable for the early tazettas, which bloom as early as October and continue thruout the winter and early spring, stretching the bloom season considerably. If we grow *N. viridiflorus* and *N. serotinus*, which bloom in September, and the late poets and *N. × biflorus*, which bloom into May, we have a nine-month blooming season for our favorite flower. However, the late 3's and the 9's, which contain most of the white whites, bloom too late for our shows, and spells of hot weather in April tend to blast the blooms, rendering them disappointing, to say the least.

Pests and diseases occur as elsewhere. Along with traditional corrective measures we also believe that breeding new and desirable cultivars to some of our earlier blooming and resistant varieties, and culling, selecting, sibbing, and backcrossing the resultant seedlings will give a line of daffodils especially suited to our mild winter, hot summer climate.

How the Symposium can help? Even though we know we cannot grow some varieties as successfully as can those in sections with colder winters, nevertheless the Symposium can be relied on to influence our choices, especially if we exercise a little restraint, and eliminate the later poets, 3's and 4's, substituting earlier 2a's, 2b's, tazettas, 5's, 6's, and 7's, all of which thrive here.

MRS. CAPEN:

The next sub-climate zone, 8a, with an expected minimum temperature of 10° to 15° stretches across eight states from Texas eastward to the southern end of Chesapeake Bay. On the Pacific side, it falls on higher land than that explained by Mrs. Anderson, through California, but appears along the northern coast of Canada and into Alaska. Most significantly to ADS members, this is the climate zone where our hybridizer-growers, Grant Mitsch and Murray Evans work. To delineate the idiosyncrasies of daffodil-growing in zone 8a, we called on Mrs. Walter E. Thompson of Birmingham, Alabama.

MRS. THOMPSON:

After hearing Mrs. Roof on how to plant and what to do for your daffodils in a general way, and Mrs. Anderson on how her section of the country differs from the general situation, I am to tell you how our section differs from the others.

Most of Alabama is in zone 8a and the average minimum temperature is 10° to 20°. Sometimes it gets a little mixed up as it did in January of this year when we had three days of 5° weather.

In Birmingham in January the average monthly high is 57°F., in February 59° and in March 67°. The monthly low is 36° in January, 38° in February and 42° in March. The average rainfall in January is 5 inches, in February 5 inches, and in March 6 inches.

This average varies — take the 6 inches of rain in March. Well, on March 19 this year we had 8 inches in 24 hours. The temperature reached 76°.

Our daffodil season is late January, February, March, and maybe a few days in April. March 15 is considered peak, so a show set about this time will get the early ones if the season is late and the late ones if the season is early and in a normal season will usually get all classes and divisions. This year we had the entire classification covered except two classes, 3c and 3d.

Cultural practices are chiefly concerned with offsetting the effects of excessive heat. We plant deep and plant among shrubs or in high shade of trees. We do not dig every year, but only when we get a great deal of foliage and sparse bloom. For the miniatures we put the bulbs in pots and then sink the pots to about ¾" above ground level. We cover the pots with hardware wire to keep the squirrels out of the pots.

We fertilize just a little when our foliage is about 3 or 4" high, then we fertilize more after the daffodils bloom, with 0-14-14.

One important thing for gardeners to remember is that daffodils do not like wet feet — they must have good drainage. We are indeed lucky to have a sloping garden which is just about perfect for daffodils.

In our zone your bulb bed must be watered occasionally during the hot summer, especially if we get a long hot spell. Don't let it bother you to water a smooth piece of ground — it won't be smooth next spring — it will be covered with daffodils.

In the South we seldom have a time when our bulbs are completely dormant, so digging and dividing presents something of a problem. We usually dig and replant immediately and have had good success. A word of caution to new gardeners: never divide all your bulbs the same year; dig only about ¼ or ⅓. Then too in planting put some of the small bulbs with the large ones — never all small or all large.

South of Birmingham where the ground slopes down to the coastal plain of the Gulf of Mexico, daffodils are occasionally successful, but are best treated as annuals. The alternative is to dig the bulbs annually and refrigerate them. Golden Spur, *N. × odorus* (Campernelles), and Laurens Koster do well all over the South — you never have to dig them.

As elsewhere in the United States, the need is for locally-bred daffodils mingling the decorative qualities of the better garden varieties with the health and persistence of the naturalized forms.

We find that most doubles do not do well for us. They put up fine buds, but at a time when we are having temperatures that may drop 30 to 40 degrees in 24 hours. The buds are so nice and plump and juicy that they freeze. The small-flowering varieties of doubles do best: Cheerfulness, Bridal Crown, Erlicheer, and the late White Marvel.

Jonquils and triandrus grow well in the South, although many seasons we only get one blossom to a stem.

Tazettas are one of our best types, although trumpets, large cups and cyclamineus hybrids are fine. The small cups do well unless we get early hot weather, which affects them since they bloom late.

We have been asked to give you the blooming dates on certain varieties.

We check our flowers each year and record the date of first bloom: "Minimus" — January 28th; February Gold — February 15th but may vary 2 weeks either way; Kingscourt — March 14th; Festivity — March 13th; Tresamble — March 21st; Geranium — March 23rd; Frigid — April 12th. Fortune has, for the last 14 years, bloomed any time from February 2 to March 6, but usually it blooms on February 14.

Please plant the name of your flower when you plant the bulb. You can't possibly remember all the names, at least not at first. Once in a while somebody will say, when the flowers are gone, "All those signs look like tombstones" and you know something — sometimes they are! If you see one turned backward in your garden it probably marks a grave or we are letting the daffodils see who they are supposed to be — sometimes some growers will send you the wrong daffodil. We either buy again — from another grower — or dig and put them in the cutting garden.

Gardens are built by trial and error. Don't take anybody's recommendation as to what will or will not grow in your vicinity. Try many varieties of daffodils.

Now let me offer you some suggestions. You must be on speaking terms with your daffodils — there absolutely cannot be a generation gap. Know your flowers by name, talk with them and they may do better for you. Now you gentlemen — just a word of advice — be sure your wife knows the names of the daffodils too — because if you start talking about Suzy, Polly, Kitty, Susan Pearson, and Patricia Reynolds you might get into trouble.

This is a generation of protesters, so if your daffodils don't bloom to suit you, protest! Tell them what you will do if they don't bloom right next year. You never can tell, it might help.

I'm sure you have all heard of the chicken farmer who burns lights all night in the chicken house to get more eggs. I recently heard of a gardener who was burning flood lights all night in her garden and claiming she had more daffodil blooms. The latest idea is to pipe music into your garden. Exactly what kind of music I don't know; begin with Bach and run the gamut to Western and Country. If you try this one let me know the kind of music the daffodils like best.

MRS. CAPEN:

Moving north from the "establishment" zone, we come to the stripe, called Zone 6, where winter lows reach from zero to  $-10^{\circ}$ . This zone extends from Arizona, across the Corn Belt, the Ohio River Valley, borders Lake Erie and Lake Ontario, appears inland across the northeast and along the coast of Newfoundland. Mr. John R. Larus, of West Hartford, Connecticut, explained how daffodils grow in Zone 6, how best culture varies from the "establishment" way.

MR. LARUS:

The Hartford area in central Connecticut is placed in Zone 6, which is another way of saying that our minimum winter temperatures should normally not fall below  $-10^{\circ}$ F. Actually winter temperature minimums are not so much the governing factor with daffodils as they are with plants that have to sustain their winter growth above ground, for with them extended cold below a critical point means certain death. Some of our daffodils, such as *N. romieuxii* and *N. scaberulus* and the smaller tazettas, often refuse to endure our cold winters, but daffodils in general are more dependent on the type of summer and fall weather they have to endure. In our area, there is

a comparatively even spread of our 40-inch moisture precipitation throughout the year, while our soil temperatures do not rise to great heights in mid-summer. Some types, therefore, such as *bulbocodiums*, *Canaliculatus*, *N. juncifolius* (as well as the hybrid Silver Chimes) that like to be kept warm and dry during their rest period do not do well with us. Most of these start growth above ground early in our fall season, and suffer damaging leaf freezing in our severe winters; our best remedy is to dig them promptly when they die down in June, keep the bulbs in a dry warm cellar, and replant early in October. If some of the smaller bulbs are grown in plastic berry baskets, they can be lifted undisturbed.

A species daffodil is one that has come with unaltered genes from one particular habitat, and unless its essential home conditions can be duplicated it is not likely to be happy. Hybrids, on the other hand, not only have the elasticity of mixed ancestry, but in general are more adaptable or they would not have been commercial successes. As a rule, we do best under our conditions when we confine ourselves to hybrids that are at least 8 inches tall.

Our climate, however, has its compensations. Whites do not seem to present anything like the basal-rot problems they do in warmer climates, and poets are particularly robust and easy. Because our summers are not hot and dry, moreover, we can replant our bulbs as soon as we dig them, without holding them out for several months as is expedient in many areas. We are very careful, incidentally, to plant our new bulbs as soon as they arrive in order to afford them every opportunity to make good root growth before our early cold weather. As in other regions, it is very important to water well upon planting, but our frequent fall rains usually save us this chore.

Blooming dates for the varieties listed are: "Minimus" — April 1; February Gold — April 18; Kingscourt — April 28; Festivity — May 1; Tresamble — May 8; Geranium — May 9; Frigid — May 17.

As to "what we can learn from our ADS Symposium," my personal feeling is that a symposium of some sort is of inestimable value in attracting and guiding new members. The advanced grower may sigh for the article by the expert on novelties (the type of article which keeps the industry from standing still), but the much greater number that want early guidance in starting a collection find the work of our chairman invaluable, and I feel strongly that it should be repeated, at least in some similar form, each year. While her method of universal suffrage entails a tremendous amount of work and agony, it has the incalculable advantage that there are enough returns to allow the results to be subdivided by regions and the tabulations sent to the vice-presidents, thereby furnishing a very important addition to their regional newsletters.

MRS. CAPEN:

I will summarize for Zone 5 and also for Zone 4, which I think may interest members, in view of the trend to a second home. And it will complete the zonal picture.

Zone 5 extends from mid-Arizona and New Mexico eastward across the country north of Zone 6. The particular concern in Zone 5 is protection from cold, especially as our cold waves often come with no snow cover. Protection is achieved three ways: (1) by deep planting — a foot is not too deep for standard sized bulbs, especially in decorative plantings, if the soil has been prepared to two feet, but six inches from shoulder of bulb to soil surface is adequate; (2) by what I sometimes call "interior mulching," that

is, peat moss or other humus generously incorporated in the entire two feet a bulb will use; and (3) by top mulching — with whatever you can get — at least two inches and as much as four inches for bulbs planted late.

Zone 5 can grow some of every class well, but many popular types simply cannot survive our cold. None of the interesting little species, such as the fall and winter-blooming ones, can we grow outside, although they do well and are rather fun inside in pots in a cold house. *Bulbocodiums* bloom but once, if at all.

*N. jonquilla*, the Queen of the South, will sometimes bloom once, but rarely even that. Unfortunately, she seems to transmit her tenderness along with her good traits. Her new progeny, in their multiple hues — red, orange, chartreuse, and white — grow to huge bouquets, and then, when we have a cold year, are cut to grass.

And yet, older ones persist. Of species, *N. rupicola* and *N. watieri* will seed and reproduce. Older 7b's, such as Trevithian, Golden Perfection, and Nirvana are perennial standbys.

The 7a's as a group are more tender. Shah, discovered and touted by Harry Tuggle, we can barely keep alive. Golden Sceptre is not for this zone. Sweetness, Golden Incense, and Aurelia will do well.

Others with cold weakness are, of course, the tazettas. "Compressa" and Scilly White gave us a momentary thrill, but did not survive the year. We do grow satisfactorily many of the poetaz, those tazettas with a shot of hardy poet genes. Laurens Koster, Geranium, Canarybird, Chinita, and Winter Pride do well in this zone, but the much-loved Silver Chimes and Matador are simply too tender.

Against this negative pattern of growing daffodils in Zone 5, let me tell you our good points. Daffodils are the breath of spring for us, and we have waited longer for it. "Minimus," which of course we always plant on a southern slope in front of a reflecting rock, will start our outdoor year at the end of the first week in March. It is then a long wait to February Gold, one that we keep trying to fill with other daffodils, but more successfully with drifts of scillas, puschkinnias, such mole-detering bulbs, and early shrubs.

The first week in April finds all the 6a's in flower. They, too, are in a warm location, to advance their bloom. It will take another two to three weeks before we can count on such as Kingscourt, and it will be the first of May for the big midseason display, that will then be replaced by the cluster groups. When we do not have that occasional spring blast of heat, daffodils are still in bloom the second week in June, not only Frigid, but other lates, which we are assembling on a west slope to delay flowering.

For this zone, with the reservations above, the Symposium is a valuable guide. This year, the Symposium lists the top seven in 25 categories. Any dabbler in daffodils will find this to be a fool-proof list of the best from which to choose, while a judge will certainly want to grow all to keep his list up to date, and even a fancier may find some among the 175 that he has missed.

Zone 4 includes many areas popular for vacation homes, lakelands and mountainsides of the northern tier of states and down east along the coast of Maine. Here the minimum winter lows reach to  $-25^{\circ}\text{F.}$ , and such favorite spring signposts as forsythia and dogwood will not survive.

But daffodils thrive; the cool, long days of late May and June, the frequent fogs, and gentle sun produce a size, substance, and glowing color not seen in flowers from farther south.

Dr. Weiss is establishing a test garden in memory of his parents in this zone in Minnesota, and we have been growing daffodils for several years on Vinalhaven in Penobscot Bay, Maine. We grow in almost pure peat and a little granite dust on the edge of spruce woods and clearings in alder swamps.

Our way of planting is a bit different and might be of interest. Having planned for a clump or drift where some June sun will reach, I take a long nursery spade and probe among the spruce roots and granite for foot-deep spots, which I mark with sticks of spruce for quick late planting, sometimes in snow flurries in November. At that time, with each bulb goes a bit of superphosphate, and the stick is returned, so that in spring we can check our success, and so later we can add.

Our spruce sticks have revealed that the combination of late planting with early and cold winters leads to some bulb rot. However, when we planted our forced bulbs in August we had excellent recovery, sometimes 100% in two years. There is never a summer heat problem on the Maine coast.

As one would surmise, the types susceptible to cold in Zone 5 are less hardy here. Of the jonquils we have tried so far, we can recommend only Golden Perfection and perhaps Nirvana; we have had no success yet with any tazettas, even the Cheerfulness sports. On the other hand, all other types will amaze you with their size, substance, and intense and pure colors.

Anyone gardening in coastal areas of the north woods must be sure his daffodils receive adequate sun. The frequent fogs and the reaching shade from heavy spires of spruce turn what appears to be "full sun" into "half shade." The lower sun of the North dictates that only southern slopes are suitable.

We have a local problem we have not solved. When we open an area to let in the sun, in these dense woods, previously almost bare beneath, and then add some fertilizer, there appear magnificent drifts of goldenrod, providing a spectacular display in August and September. But daffodils cannot compete with this rampant growth or that of the raspberries that come wherever the sunshine reaches. We hope to find some chemical means of coping with this problem.

The season in Zone 4 is not only the latest but probably one of the shortest of all. "Minimus" blooms about the end of April. February Gold is in bloom the last week in May, immediately followed by others so that "Daffodil Day on Vinalhaven" falls on Memorial Day, when all but the latest are in flower. We have never waited to learn the end, but we have sometimes in mid-June had the fun of returning to New Jersey with a thousand daffodil blooms to arrange or display.

So, if your Shangri-La is a hunting or ski lodge in the mountains, a fishing camp on some northern lake, or a sailor's snug harbor on coastal Maine, by all means take some daffodil bulbs when you go there next summer, and then slip back for a long Memorial Day week-end and enjoy an encore of daffodils.

Having sketched the variations of daffodil growing from Zone 10 to Zone 4, we called on a member of our host region to tell us how the Southwest Region is using the Symposium to educate its members—Mr. Carl R. Amason of El Dorado, Arkansas.

MR. AMASON:

I live in southern Arkansas, not far from the Louisiana line, and I think perhaps that I come from farther south than any of the other people who

regularly attend the conventions of the Society. Daffodils do fairly well for me, and I suspect that I grow more than I should, in too much evergreen shade, for the best results. So I grow more or less for landscaping purposes. My season usually begins in late January when I seek and find my first blooms of *N. jonquilla* or *N. asturiensis* ("minimus"). These two species generally come into full bloom in early to mid-February followed by February Gold in mid-February; Kingscourt blooms about the first of March; Festivity and Tresamble bloom around the middle of March during the peak of my season, and before they go Geranium begins. About the first of April comes Frigid, a variety which I have had but I'm not sure if I know at this time. The last to bloom is *N. × biflorus*, which is in full bloom in mid-April. Most yellow trumpets grow well, but whites are tricky and rot easily, reverse bicolors perform poorly, and most pinks do not develop good color. The daffodils begin the season with predominately golden yellow blooms, midseason has all the daffodil colors, and the late season has predominately white blooms. For me, Texas never develop blooms, regardless of climatic conditions, and Effective never lives a second year. Trousseau, Arctic Gold, and Binkie are all marvelous for garden and show. Of the white triandrus hybrids, Thalia is the most widely grown, but Shot Silk, Moonshine, and Rippling Waters are all superior in form. I do not like Spellbinder for the garden and it does not develop show qualities for me. All the tazettas and jonquil hybrids do excellently. In Arkansas the RHS Division 3 was always poorly represented at the state show. As an incentive to grow this group, the Laura Lee Cox Class for a collection of five varieties of 3's was set up, and we have found that Division 3 can give us excellent show flowers.

In the Southwest Region Mrs. Ditmars was very persistent until she got a good response to her questionnaire on favorites in the region. The top fifteen varieties, in order of the most votes were as follows: Silver Chimes, Binkie, Galway, Cantatrice, Ceylon, Spellbinder, Trevithian, Trousseau, Kingscourt, Charity May, Thalia, Sweetness, Peeping Tom, Carlton, and Mt. Hood. This is an excellent list for any beginner to study.

Just because a variety is expensive does not mean that it is the finest. And just because a variety is reasonable does not mean that it is of no value. There are too many excellent varieties that are not well known, but any time that a list of daffodils contains over 3000 varieties, it stands to reason that no one will know them all. For those who are desirous of getting children to grow daffodils, Peeping Tom can create the most interest.

My soil is quite sandy. I grow many miniatures in the open ground, unprotected, and not in pots. I get good blooms from most of them, including forms of *N. bulbocodium* and *N. cantabricus*. This is one of my favorite groups, the hoop-petticoat daffodils. They begin to bloom in November, before Thanksgiving, and are among the last blooms in April. They are not prime show flowers, however.

From the map, I see there is a large area south of me that is poorly represented in ADS, yet I know that many, many varieties of daffodils grow in this area, all the way to the Gulf coast. It is a shame that daffodils are not better known here as it is an area of great potential. In fact, the South is one of the greatest daffodil growing and hybridizing potentials in the United States.

## OF SHOWS, EXHIBITING, AND JUDGING

**EXHIBITORS:** Much last-minute confusion can be avoided by better home-work. Study the schedule: even established shows sometimes make changes. Cleaning of blooms, checking names and classifications, eliminating surplus blooms, and preparation of entry tags: much or all can be done at home.

Careless spelling, illegible handwriting, and incomplete names detract from the educational value of the show and make record-keeping more difficult. Many exhibitors use rubber stamps or small gummed name-and-address labels to save time and ensure correct reporting.

Need we mention consideration — for other exhibitors and for the show committee — and good sportsmanship?

**SHOW MANAGEMENT:** There are problems of space, time, and personnel. Most problems concerning space have to be considered in the early stages of planning, as decisions will be reflected in the schedule. Imaginative planning, especially for arrangements, can solve some problems. In allocating space for horticultural classes it may pay to make notes of trouble spots one year for guidance the next.

**TIME:** Is enough time scheduled between closing of entries and judging for the necessary clean-up and last-minute checking and shifting? Is judging started on time? Are the judges told how much time they will be allowed to judge the classes they have been assigned? Is enough time allowed for unexpected delays, and for voting on "bests"? If judges are expected to sign award cards or ribbons are these available at the right time and place?

**PERSONNEL:** Are committees really committees or only chairmen? Are substitutes or replacements for all jobs being trained? Are new members asked to serve on committees? Are written instructions available for the various jobs? Forms for necessary records? Do show or committee chairmen (or judges!) overstep their authority? Do committee chairmen submit reports with comments? Is a postmortem committee meeting held?

If award cards are written, both clerks and card writers should give special care to correctness of names. See also comments for exhibitors, above.

**JUDGING PROCEDURES:** The following memorandum sent to judges of one show with their judging assignments is unusually comprehensive, and covers problems that frequently arise.

1. Please familiarize yourself with "Rules — Horticultural Section" in the program, and with wording of classes you are to judge.
2. When first called to floor, it is a good plan to glance over the whole show.
3. After a class is judged, indicate with a pencil the awards given, and leave the winning entries in the front of the class.
4. The clerks will protect their judges in seeing that not more than one ribbon is won by the same person in any class except in Sections A and C (single bloom classes, 3 entries allowed).
5. If an entry is incorrectly placed in a class you are judging, have it replaced in its proper class, which must be rejudged if necessary. If a variety is not named correctly, the entry is not eligible, and a question mark should be placed after the name, or the name lightly crossed out.
6. If a collection calls for an ADS award, every bloom in the first place winner must be able to score 90.
7. If you have an entry in a class you are supposed to judge, report to the supervisor of judges, who will assign a substitute.

8. Honorable mention may be given to any entry that is worthy of at least a third, but is beaten out by three superior entries.
9. First, second, or third ribbons may be withheld if there is no entry worthy. (Leniency is suggested in Section C (less advanced growers).)
10. When a team's assignment is completed, sign judges' sheets and report to supervisor of judges.
11. The two teams judging Section A should select its best blue ribbon entry, and then the two teams should agree on the best entry in the division. The same applies to the two teams judging Section C. Any judge may then select candidates, other than from these two Sections, for the best single bloom of the show from any large-flowered class in the show that he has judged, and all the judges will then vote in the selection of the best in the show (Gold Ribbon). (Similar directions for selecting best vase of three.) The team judging Section E (miniatures) should select the best single stem in the Section (Miniature Gold Ribbon).

*Some specific judging problems will be discussed in the March issue. Contributions are invited.*

## HERE AND THERE

### NEWS FROM THE REGIONS AND LOCAL SOCIETIES

#### MIDDLE ATLANTIC REGION (Mrs. Richard N. Darden, Jr., *Regional Vice President*)

The September issue of the News Letter is, as always, full of quotable material about daffodil names and daffodil growers. Some of it will appear in later Journal issues.

A highly successful fall regional meeting took place on Saturday, Sept. 26, with about 60 attending. Speakers were Marie Bozievich and Frances Armstrong, who gave a joint account, with slides, of their trips to Ireland, England, and Holland this spring; Nancy Fitzwater, who conveyed the excitement and inspiration of daffodil hybridizing; and Wells Knierim, who shared his trip to New Zealand with us. The newest ADS slide set, "107 from Grant Mitsch," was also shown.

#### WASHINGTON DAFFODIL SOCIETY (W. O. Ticknor, *Editor*)

The fall meeting on October 25 featured the travels of Marie Bozievich, the delivery of bulb orders (as far as complete), refreshments, and a generous supply of door prizes. As usual, no one went away empty-handed, and newer members shared the surplus that remained after everyone had had a turn to select from the table.

#### NORTHEAST REGION (Mrs. Marvin V. Anderson, *Regional Vice President*)

About 20 directors joined regional members for a meeting the Sunday morning following the directors' meeting in Wilmington. The speakers were Roberta Watrous, with slides of miniatures, and Willis Wheeler, whose talk on daffodil diseases was illustrated by sample bulbs as well as slides. After the meeting members enjoyed the Hotel DuPont's lavish buffet brunch.

## NEW ENGLAND REGION (George S. Lee, *Editor*)

The Newsletter of August 15 is devoted chiefly to the annual review of catalogs. Those included are: J. Gerritsen & Son, Mrs. Lionel Richardson, Ballydorn Bulb Farm, Carncairn Daffodils, Ltd., Daffodil Mart, W. J. Dunlop, Mary Mattison Van Schaik, Charles H. Mueller, Grant E. Mitsch, David Bell, G. Zandbergen-Terwegen, Michael Jefferson-Brown, Murray W. Evans, P. de Jager & Sons, Inc., and Broadleigh Gardens.

## OTHER NEWS TIDBITS

Willis H. Wheeler, who has filled various offices in ADS and is now Chairman, Health and Culture Committee, recently retired from his position of Assistant Director, Plant Quarantine Division, U. S. Department of Agriculture. All his 40 years of service were spent in that Division, the first 16 on the West Coast (Seattle and San Francisco), and the remainder in Washington, D.C.

Jack S. Romine reports a successful meeting of the Northern California Daffodil Society, featuring a round table on miniatures.

The New York Times garden pages of Sunday, September 13, included an article on daffodils by Marion G. Taylor, New England Regions vice president.

The April 1970 issue of *Horticulture* includes an article that will appeal to devotees of miniatures. "Alec Gray's Daffodils," is the title, and it includes an illustration in color of Mr. Gray himself, taken by the author, Jean Kilborn.

## THE JOY OF GROWING MINIATURE DAFFODILS

By POLLY BROOKS, *Richmond, Virginia*

The daffodil season is just about over for me (April 27). Reprieve and one jonquilla are the only ones not yet opened. The miniature daffodils now in good bloom in my garden are: Tweeny, Kidling, Pixie, Pixie's Sister, Baby Moon, late-planted April Tears, something that looks like Demure but with a pinkish-buff cup and smaller than Demure, and—oh, joy!—two stems of Raindrop! Last fall where Raindrop and several other choice miniatures were, some neighborhood dogs dug big holes. I sifted through piles and piles of soil looking for small bulbs, but not a one did I find. I pushed the soil back into the big cavities and luckily did not have the time to plant anything else there. I was so very happy to find these two Raindrops in flower—they must be very deep, coming into bloom so late. I shall guard them and hope they will increase; I once had a clump of Raindrop that had as many as 11 stems.

One of the greatest joys in life comes from sharing, and sharing miniature daffodils (both blooms and bulbs) is a very special kind of joy! Exhibiting or displaying these blooms is also a way of sharing them with others, as well as taking them to sick people and friends. When the first miniature *N. asturiensis* opens in February I cut them freely and continue to cut and enjoy sharing the miniatures until the last blooms at the end of April. They

are especially good to take to friends in the hospital as they are so easy to take and always create some conversation and are usually admired by all who see them. They take such a small space on the hospital table or wherever you place them. There is always room for a few miniatures. Try taking a few — just one or three or five or whatever you can spare — to your favorite doctor or dentist where the waiting in the waiting room seems forever. Or perhaps to your favorite eating establishment (placed close to the cash register where paying the bill will have a ray of small sunshine). I have also supplied them to houses open during Garden Week in Virginia where they have been seen by many people and often are the only flowers remembered.

The most pleasure derived from growing miniature daffodils came to me the four years I did the flowers for my good friend Mrs. Godwin at Virginia's Executive Mansion. There from early February with *N. asturiensis* till the end of April with Kidling, Tweeny, Baby Moon, etc., the miniature daffodils were on display. Many people who came to the Mansion saw miniature daffodils for the first time, and always admired them. "Where can I buy some?" became a very frequent question. I wished for a good answer! On occasions I saw people who knew flowers and who knew that Mrs. Godwin used only real live flowers, touch and feel them because they could not believe that such a thing really was. I believe that Flomay was the one miniature daffodil most admired by most people. I usually had a good supply of this variety and of Hawera. The ladies loved Hawera because of its color and grace.

I seldom used other flowers with miniatures. I treated them as precious jewels and thought them adequate. Just their own foliage (when there was enough to steal some). However, I do not recommend this as taking the foliage sometimes decreases the number of blooms the following year and sometimes the species will skip a season of bloom. Usually I used foliage from crocus species, eranthis, snowdrops, anemone, or whatever was available in the garden at that time and was compatible with the blooms. I have used and loved violets and violet foliage with Hawera because I first saw it that way growing in my garden. I am fighting violets (mostly Confederate violets) in my miniature daffodil beds, which they are trying to take over. If I could keep the violets under control I would love a solid mass of Hawera behind a solid mass of blooming violets—Hawera blooms are just tall enough to look lovely above the violets.

Our former gracious First Lady of Virginia loved and admired the little daffodils while she graced the Mansion. I plan to start a bed of miniatures for her this fall at the new home they are building on the Nansemond River. Daffodils should do well there because it is all woody soil, although very windy on the river. Both she and I like particularly the very small ones such as *N. asturiensis*, *N. watieri*, *N. rupicola*, *N. calcicola*, Raindrop, Flomay, Rosaline Murphy, also Hawera, Snipe, Small Talk, etc.

Miniature daffodils are not difficult to grow and keep if you can (1) give them a suitable place to their liking preferably with woody soil, and (2) leave them undisturbed unless and until they become very crowded. Species very seldom do. I have been growing some miniature daffodils since 1948 — *N. asturiensis* (then called *minimus*) was my first one and still is among my favorites because it is so very early, so heavenly fragrant, and so dependable, altho it does not multiply for me. I have some *asturiensis* that bloom in the same spot where they were planted ten years ago. The bulbs of *asturiensis*

that I have bought in the more recent years are very small and not mature enough to bloom the first year. This seems to be true with many of the small species. I have much better luck with miniatures when planted directly in the soil. However, when grown in clay pots the blooms, for me, are small and therefore more attractive. For the last two or three years I have been planting the very small bulbs in the plastic strawberry baskets. That way the soil does not dry out as it does in the clay pots. Also, this helps me to find nearly all the bulbs when I lift to divide and share.

For a beginner I would recommend varieties that are easy to flower among those that are more easily available: Small Talk 1a, Little Gem 1a (if the true variety is available), Little Beauty 1b, Xit 3c, Hawera 5b, also April Tears 5b, Tête-a-Tête 6a, Sundial 7b; also Pixie 7b and Pixie's Sister 7b, Cyclataz 8; and from Division 10: *NN. asturiensis*, *triandrus albus*, *bulbocodium conspicuus*, *rupicola*, and *watieri*. AND BY ALL MEANS SNIPE if you can find it! After these flower for you for a year or two, you will start looking for more miniatures such as Flomay, Stella Turk, Tanagra, Peaseblossom, Rosaline Murphy, Halingy, Minnow, Raindrop, Kidling, Quince, Snipe, and others.

Do try a few. You will be glad you did.

## IT'S NEVER TOO LATE!

By LEONORA C. WILKIE, *Bellbrook, Ohio*  
(From *Midwest Region Newsletter*, January 1970)

Did you get all your daffodils into the ground last fall? Or are there a few bulbs lying in the basement or garage . . . (perish the thought!) Well, if you are a hit-or-miss gardener like me, and the leftover bulbs are still firm (they may even have green tips showing), you can salvage them. Several years ago, the local hardware store had several unsold bulbs left in February of the following year. I bought the lot and planted all those that were not soft or dried. Though the frozen top soil had to be loosened with a crowbar, I got them all planted by March 1. There was a surprisingly small loss even among the hyacinths and tulips. Some of the tulips have increased into large clumps, and as far as I can check, planting so many in so many places, all the daffodils survived to this day.

In 1968 I dug more bulbs than I could replant or give away, so there were quite a few left when it was no longer possible to plant them outdoors. After the holidays, I began to plant them in large containers, mostly cheap plastic buckets. Holes were punched in the sides near the bottom for drainage. During warm spells I got in enough gravel and soil to gradually get all the bulbs planted. They were planted about halfway down in the buckets, placed in an unheated room in a dark place until the tips showed above ground. Then they were brought out into the light. On mild days they were placed out doors near the house for more light. They bloomed beautifully with as good size and quality as if they had been planted outdoors. I cut most of the blooms almost at once; others were removed as soon as they faded. The plants were watered, fertilized and placed outdoors as soon as the weather permitted. After the foliage died down, they were carefully removed from

the buckets and planted in large holes dug for them in the garden. Whether they will survive or not is something only time will tell, but the blooms were so beautiful in the house, it was well worth the effort.

I planted most of the miniatures last fall outdoors, but put some in pots in October; put them in the old refrigerator until the first of December; brought them out into the unheated room (where I "winter" geraniums and such); watered and tended them along with the other plants. Most of them grew only foliage, but one little fellow marked "cyclamineus" has produced an adorable 1a bloom. SOMEBODY (me??) goofed!

## FLIGHT OF THE ROBINS

By DR. GLENN DOOLEY, *Bowling Green, Ky.*

Another daffodil season will soon be here. This is a good time to join one or more of the Round Robins. We would like more members from all areas. We hope that enough interested people will join with Roberta Watrous as director to form a robin on species daffodils. More information is needed about this group.

Dr. Tom Throckmorton gave a partial list of excellent varieties for his area — Iowa. It seems to me that the success of growing daffodils in cold climates depends largely on the fact that a bulb must be well rooted before going into deep winter. A snow mulch is usually most helpful. Dr. Throckmorton finds Dachtyl in the granular form satisfactory as a preemergence chemical.

Lucile Simperts sent an interesting report on the varieties of double daffodils she grew in Indiana. With the newer double varieties coming on the market there are some real beauties available. Some she mentioned were Gay Time, Double Event, Candida, Bali Hai, Enterprise, and White Marvel. She also reported that her best garden variety was Aerolite, a variety that has been with us for many years.

Alice Snell, of Blue Mound, Illinois, wrote that Luna Moth was spectacular, and that Bethany and Binkie were the best reverse bicolors for her.

## U. S. REGISTRATIONS IN 1970

*Reported by MRS. KENNETH B. ANDERSON, Registration Chairman*

American registrants of new daffodils and their registrations for 1970 are: Brink, Venice; Nashville, Ill.: Cahokia, Layonah, Makanda, Radford.

Evans, Murray W.; Corbett, Ore.: Chiquita, Honeymoon, Idlewild, Limberlost, Lostine, Minx, Minikin, Monument, Royal Coachman, Sunapee, Tillicum, Yosemite.

Fowlds, Matthew (by Grant E. Mitsch): Grosbeak, Philomath, Pleated Skirts, Stint.

Ismay, A. L.; Fulton, Mo.: Edna Lee Ismay.

Mitsch, Grant E.; Canby, Ore.: Cameo Queen, Canby, Cassowary, Eclat, Eider, Fiancee, Flycatcher, Gazelle, Palmyra, Paradox, Perky, Petite, Petrel, Puppet, Red Lory, Step Forward, Sun 'n' Snow.

Pannill, William G.; Martinsville, Va.: Aquarius, Chariot Wheel, Chianti,

Drummer Boy, Figurehead, Full Fashion, Golden Chord, High Tea, Imprint, Intrigue, Javelin, Jovial, La Mancha, Manifest, Maverick, Mountain Dew, Pompeii, Revelation, Royal Trophy, Soft Light, Spartan, Star-mountain, White Label, Williamsburg.

### Registrations

Measurements given are: height (H.); diameter of flower (F.); length of perianth segments (P. segs.); length of corona (C. lgth.); diameter of corona (C. diam.)



- Aquarius (Pannill) 3c; late; H. 50.8 cm.; F. 102 mm.; P. segs. 43 mm., white; C. lgth. 13 mm.; C. diam. 23 mm.; white. C7A (Easter Moon × Chinese White)
- Cahokia (Brink) 1d; late midseason; H. 17"; F. 93 mm.; P. segs. 34 mm., soft lemon yellow becoming paler; C. lgth. 36 mm., C. diam. 25 mm., bright rose pink, turning to white. 59-9 (Tintoretto × Rosy Trumpet)
- Cameo Queen (Mitsch) 2b; midseason; H. 28 cm.; F. 80 mm.; P. segs. 32 mm., pure white; C. lgth. 14 mm., C. diam. 29 mm., band of wild rose pink with white base. V105/1 ((Wild Rose × Interim) × Rima)
- Canby (Mitsch) 2b; late midseason; H. 53 cm.; F. 110 mm.; P. segs. 45 mm., milk white, broadly overlapping; C. lgth. 31 mm., C. diam. 50 mm., salmon pink with lilac suffusion. Tall vigorous grower with good stems. A34/11 (Precedent × Carita)
- Cassowary (Mitsch) 2b; late midseason; H. 52 cm.; F. 115 mm.; P. segs. 48 mm., milk white; C. lgth. 35 mm., C. diam. 62 mm., apricot yellow on opening, developing a zone of salmon pink about halfway to the base. Large bowl-shaped crown, much frilled and lacinated. A47/1 ((Mabel Taylor × Green Island) × Carita)
- Chariot Wheel (Pannill) 3b; midseason; H. 45.7 cm.; F. 99 mm.; P. segs. 33 mm., white; C. lgth. 10 mm., C. diam. 23 mm., yellow with red rim. B24A (Corofin × Autowin)
- Chianti (Pannill) 2a; midseason; H. 48.3 cm.; F. 97 mm.; P. segs. 40 mm., yellow; C. lgth. 18 mm., C. diam. 38 mm., red. C54A (Ceylon × Jezebel)
- Chiquita (Evans) 2b; midseason; H. 16"; F. 3½"; P. segs. 1½", white; C. lgth. ⅝", C. diam. 1", pink with green eye. H30 ((Interim × Green Island) × Caro Nome)
- Drummer Boy (Pannill) 1a; early midseason; H. 53 cm.; F. 82 mm.; P. segs. 35 mm., yellow; C. lgth. 38 mm., C. diam. 51 mm., yellow. B25A (St. Keverne × Golden Rapture)
- Eclat (Mitsch) 2b; late midseason; H. 15"; F. 4"; P. segs. 1⅞", pure white; C. nearly flat, C. diam. 2.2", coral salmon, lighter in center. A5/5 (Caro Nome × Accent)
- Edna Lee Ismay (Ismay) 2b; late; H. 18"; F. 4"; P. segs. 1⅞", white; C. lgth. 1¾", C. diam. 3", deeply ruffled, alabaster. 200XX (Ada Finch × ?)
- Eider (Mitsch) 2c; midseason; H. 58 cm.; F. 120 mm.; P. segs. 52 mm.,

- white; C. lgth. 30 mm., C. diam. 42 mm., white. Z41/1 (46/2 (Bread and Cheese × Trousseau) × Greenland)
- Fiancee (Mitsch) 2b; late midseason; H. 43 cm.; F. 115 mm.; P. segs. 47 mm., white; C. lgth. 27 mm., C. diam. 63 mm., flared saucer-shaped frilled crown with clear pink band shading to nearly white at the base. A34/25 (Precedent × Carita)
- Figurehead (Pannill) 1c; midseason; H. 45.7 cm.; F. 107 mm.; P. segs. 40 mm., white; C. lgth. 45 mm., C. diam. 36 mm., white. B1B (Broughshane × Vigil)
- Flycatcher (Mitsch) 7b; late; H. 38 cm.; F. 60 mm., P. segs. 28 mm., clear yellow; C. lgth. 13 mm., C. diam. 21 mm., slightly deeper shade of yellow. Two blooms to a stem. E38/1 (A32/1 (Playboy × Firecracker) × *N. juncifolius*)
- Full Fashion (Pannill) 2b; late midseason; H. 40.6 cm.; F. 89 mm.; P. segs. 35 mm., white; C. lgth. 25 mm., C. diam. 33 mm., pink. B26A (Rosario × Carita)
- Gazelle (Mitsch) 7b; late midseason; H. 58 cm.; F. 65 mm.; P. segs. 28 mm., pale lemon; C. lgth. 10 mm., C. diam. 21 mm., pale lemon fading to near white with amber throat. Very tall and vigorous, flat perianth. Z2/40 (Aircastle × *N. jonquilla*)
- Golden Chord (Pannill) 1a; midseason; H. 48.3 cm.; F. 107 mm.; P. segs. 45 mm., gold; C. lgth. 48 mm., C. diam. 38 mm., gold. D43A (Arctic Gold × Royal Oak)
- Grosbeak (Fowlds) 2d; midseason; H. 50 cm.; F. 86 mm.; P. segs. 38 mm., soft lemon; C. lgth. 24 mm., C. diam. 39 mm., lemon yellow fading to white; quite unlike any other of the d's, having shorter, much flared crown. F195/2 ((Fortune's Sun × Cheerio) × Binkie)
- High Tea (Pannill) 2b; midseason; H. 45.7 cm.; F. 91 mm.; P. segs. 38 mm., white; C. lgth. 25 mm., C. diam. 43 mm., pink. D69A (Caro Nome × Accent)
- Honeymoon (Evans) 1a; early; H. 18"; F. 4½"; P. segs. 1⅞", yellow fawn; C. lgth. 1⅞", C. diam. 1¾", yellow fawn. Very durable and retains same color throughout life of bloom. H-4 (Trousseau × Cantatrice)
- Idlewild (Evans) 3b; late; H. 15"; F. 3⅝"; P. segs. 1⅝", white; C. lgth. ⅝", C. diam. 1", lemon yellow with green eye. Resembles Alberni Beauty, but with shorter neck and more precise form. F-311 (Alberni Beauty × (*N. poeticus recurvus* × Carolina))
- Imprint (Pannill) 2b; midseason; H. 43.2 cm.; F. 97 mm.; P. segs. 40 mm., white; C. lgth. 35 mm., C. diam. 46 mm., yellow. B6A (Green Island × Festivity)
- Intrigue (Pannill) 7a; late midseason; H. 35.6 cm.; F. 51 mm.; P. segs. 20 mm., yellow; C. lgth. 18 mm., C. diam. 18 mm., white. D54A (Nazareth × *N. jonquilla*)
- Javelin (Pannill) 2a; midseason; H. 48.3 cm.; F. 97 mm.; P. segs. 38 mm., yellow; C. lgth. 30 mm., C. diam. 36 mm., red. D68A (Paricutin × Vulcan)
- Jovial (Pannill) 5a; midseason; H. 43.2 cm.; F. 53 mm.; P. segs. 23 mm., yellow; C. lgth. 20 mm., C. diam. 23 mm., orange. D51A (Narvik × *N. triandrus concolor*)
- Killdeer (Mitsch) 6a; midseason; H. 15"; F. 3.5"; P. segs., greenish lemon

- with white halo; C. diam. 1", light lemon with deeper edge. Has broad segments, pointed and much waved, making a most graceful flower. C55/1 ((Green Island × Chinese White) × *N. cyclamineus*)
- La Mancha (Pannill) 2c; late midseason; H. 48.3 cm.; F. 91 mm.; P. segs. 40 mm., white; C. lgth. 15 mm., C. diam. 28 mm., white. E9A (Easter Moon × Pristine)
- Layonah (Brink) 7b; midseason; H. 16"; F. 70 mm.; P. segs. 40 mm., bright yellow; C. lgth. 27 mm., C. diam. 30 mm., bright yellow. Resembles *N.* × *odorus*, slightly larger; one floret to stem, very floriferous, good increaser. (Gold-digger × *N.* × *odorus*)
- Limberlost (Evans) 3b; late; H. 20"; F. 4¼"; P. segs. 1⅞", white; C. lgth. ⅝", C. diam. 1", pale primrose with white frill. C-25 (Carolina × Lady Kesteven)
- Lostine (Evans) 3c; late; H. 17"; F. 3¾"; P. segs. 1⅝", white; C. lgth. ⅜", C. diam. 1", white with green eye. (Chinese White × (*N. poeticus recurvus* × Carolina))
- Makanda (Brink) 1d; late midseason; H. 17"; F. 98 mm.; P. segs. 38 mm., lime yellow; C. lgth. 42 mm., C. diam. 49 mm., soft lime green turning to cream. Very long lasting. 59-8 (Broughshane × Spellbinder)
- Manifest (Pannill) 3c; late midseason; H. 45.7 cm.; F. 89 mm.; P. segs. 38 mm., white; C. lgth. 11 mm., C. diam. 23 mm., white C7B (Easter Moon × Chinese White)
- Maverick (Pannill) 3a; early midseason; H. 50.8 cm.; F. 84 mm.; P. segs. 35 mm., yellow; C. lgth. 10 mm., C. diam. 30 mm., red. C5B (Ceylon × Jezebel)
- Minikin (Evans) 3b; late; H. 15"; F. 3⅜"; P. segs. 1 5/16", white; C. lgth. ¼", C. diam. 13/16", yellow, red wire rim, green eye. F310/2 (Snowball × Interim)
- Minx (Evans) 3b; late; H. 16"; F. 3⅜"; P. segs. 1⅜", white; C. lgth. ¼", C. diam. 13/16", yellow with red wire rim, green eye. F310/1 (Snowball × Interim)
- Monument (Evans) 2a; midseason; H. 15"; F. 5"; P. segs. 2 3/16", yellow; C. lgth. 1½", C. diam. 2¼", deep yellow. F-292/1 (Festivity × 2b seedling of unknown parentage)
- Mountain Dew (Pannill) 1c; midseason; H. 45.7 cm.; F. 102 mm.; P. segs. 39 mm., white; C. lgth. 40 mm., C. diam. 41 mm., white. B14A (White Prince × Empress of Ireland)
- Palmyra (Mitsch) 3b; late; H. 45 cm.; F. 90 mm.; P. segs. 40 mm., white; C. lgth. 9 mm., C. diam. 30 mm., orange-red band, yellow near base. Has a very white perianth. Y5/1 (Cadence × Clockface)
- Paradox (Mitsch) 2a; midseason; H. 40 cm.; F. 123 mm.; P. segs. 51 mm., pale ivory lemon; C. lgth. 43 mm., C. diam. 50 mm., pale ivory lemon, a bit deeper at the margin. A very large flower with exceptional perfection in form and balance. Y4/1 (Binkie × Lunar Sea)
- Partridge (Mitsch) 2b; mid and late midseason; H. 38 cm.; F. 93 mm.; P. segs. 40 mm., milk white; C. lgth. 21 mm., C. diam. 47 mm., apricot-salmon heavily suffused lavender. This has more lavender in its composition than any other and crown is heavily pleated. Z28/10 (Leonaine × Caro Nome)
- Perky (Mitsch) 6a; early; H. 40 cm.; F. 80 mm.; P. segs. 32 mm., greenish

- white, fading to white; C. lgth. 30 mm., C. diam. 24 mm., clear bright yellow, paler near the base. An exceptional keeper, taller than most cyclamineus hybrids. Z39/2 (Trousseau  $\times$  *N. cyclamineus*)
- Petite (Mitsch) 7b; late; H. 38 cm.; F. 69 mm.; P. segs. 25 mm., clear yellow; C. lgth. 12 mm., C. diam. 21 mm., light orange, shading to a yellow base. Very symmetrical blooms, two on a stem; broad, smooth perianth. E39/2 (A33/1 (Playboy  $\times$  Paricutin)  $\times$  *N. juncifolius*)
- Petrel (Mitsch) 5b; late midseason; H. 38 cm.; F. 65 mm.; P. segs. 29 mm., white; C. lgth. 29 mm., C. diam. 10 mm., white. Five to nine blooms on a stem, up to five stems per bulb. (Quick Step  $\times$  *N. triandrus albus*)
- Philomath (Fowlds) 7a; midseason; H. 32 cm.; F. 50 mm.; P. segs. 21 mm., clear bright yellow; C. lgth. 13 mm., C. diam. 15 mm., clear bright yellow. One to three blooms on a stem; shows both cyclamineus and jonquilla traits. F 332/1 (Small cyclamineus hybrid  $\times$  *N. jonquilla*)
- Pleated Skirts (Fowlds) 5b; midseason; H. 32 cm.; F. 70 mm.; P. segs. 29 mm., milk white; C. lgth. 18 mm., C. diam. 33 mm., milk white. Larger, more flared coronas than most in its class; very floriferous, sometimes gives four flowers to a stem. F177/1 ((John Evelyn  $\times$  Fortune)  $\times$  *N. triandrus albus*.)
- Pompeii (Pannill) 2c; midseason; H. 43.2 cm.; F. 107 mm.; P. segs. 45 mm., white; C. lgth. 43 mm., C. diam. 38 mm., white. B1A (Broughshane  $\times$  Vigil)
- Puppet (Mitsch) 5b; midseason; H. 36 cm.; F. 80 mm.; P. segs. 36 mm., rich golden yellow; C. lgth. 15 mm., C. diam. 20 mm., bright orange red. The brightest colored triandrus hybrid. V31/3 (Narvik  $\times$  *N. triandrus aurantiacus*)
- Radford (Brink) 1b; midseason; H. 18"; F. 68 mm.; P. segs. 26 mm., white; C. lgth. 30 mm., C. diam. 27 mm., orange red. Very substantial. 59-9 (Sincerity  $\times$  Lady Kesteven)
- Red Lory (Mitsch) 2a; midseason; H. 53 cm.; F. 116 mm.; P. segs. 46 mm., golden yellow, flat and broadly overlapping; C. lgth. 30 mm., C. diam. 36 mm., vivid orange red, somewhat frilled. X42/4 ((Narvik  $\times$  California Gold)  $\times$  P59/6 (Playboy  $\times$  Alamein))
- Revelation (Pannill) 2b; midseason; H. 45.7 cm.; F. 102 mm.; P. segs. 43 mm., white; C. lgth. 33 mm., C. diam. 31 mm., orange. B49A (Bizerta  $\times$  Festivity)
- Royal Coachman (Evans) 2b; midseason; H. 20"; F. 4½"; P. segs. 1⅞", white; C. lgth. ¾", C. diam. 1¾", yellow with orange red rim. C-115 Rose Marie  $\times$  Carolina)
- Royal Trophy (Pannill) 3b; midseason; H. 50.8 cm.; F. 112 mm.; P. segs. 48 mm., white; C. lgth. 15 mm., C. diam. 24 mm., yellow with red rim. B4A (Tuskar Light  $\times$  Aircastle)
- Soft Light (Pannill) 2a; early midseason; H. 43.2 cm.; F. 104 mm.; P. segs. 43 mm., yellow; C. lgth. 30 mm., C. diam. 41 mm., pink. C9A (Fawn-glow  $\times$  Fintona)
- Spartan (Pannill) 1b; midseason; H. 53.3 cm.; F. 99 mm.; P. segs. 43 mm., white; C. lgth. 45 mm., C. diam. 36 mm., yellow. E13A (Newcastle  $\times$  Statue)
- Starmount (Pannill) 2c; late midseason; H. 48.3 cm.; F. 104 mm.; P. segs. 38 mm., white; C. lgth. 23 mm., C. diam. 43 mm., white. D11A (Easter Moon  $\times$  Vigil)

- Step Forward (Mitsch) 7a; late midseason; H. 40 cm.; F. 72 mm.; P. segs. 32 mm., soft but bright yellow with white halo; C. lgth. 22 mm., C. diam. 36 mm., soft yellow, fading to pure white. Very distinct from anything on the market now, being an F2 jonquil hybrid and reverse bicolor. D80/1 (Quick Step × Daydream)
- Stint (Fowlds) 5b; late midseason; H. 32 cm.; F. 77 mm.; P. segs. 30 mm., soft lemon; C. lgth. 16 mm., C. diam. 27 mm., slightly deeper lemon. Two or three blooms per stem. F297/1 ((Fortune's Sun × Cheerio) × *N. triandrus albus*)
- Sun 'n' Snow (Mitsch) 1d; early midseason; H. 48 cm.; F. 110 mm.; P. segs. 46 mm., rich lemon gold; C. lgth. 49 mm., C. diam. 53 mm., like perianth on first opening but fading to nearly pure white, retaining a rim of color. More strongly contrasted than any other 1d. A43/7 (0121/1 (Shirley Wyness × Pink-a-dell) × Lunar Sea)
- Sunapee (Evans) 3a; midseason; H. 15"; F. 3½"; P. segs. 1½", yellow; C. lgth. ¾", C. diam. 1⅛", yellow with orange-red band. C-146 (Carbi-neer × Ardour)
- Tillicum (Evans) 2b; midseason; H. 17"; F. 4"; P. segs. 1½", white; C. lgth. ¾", C. diam. 1⅞", salmon-apricot. D-205 ((Shirley Neale × Chinese White) × (Green Island × Chinese White))
- Top Notch (Mitsch) 2a; late midseason; H. 20"; F. 3.9"; P. segs. 1⅝", soft luminous yellow; C. 1.2", slightly deeper with white halo at base. Perfection in form and quality. B37/7 (Playboy × Daydream)
- White Label (Pannill) 1c; early midseason; H. 48.3 cm.; F. 107 mm.; P. segs. 45 mm., white; C. lgth. 48 mm., C. diam. 38 mm., white. B21A (Glenshesk × Vigil)
- Williamsburg (Pannill) 2c; late midseason; H. 50.8 cm.; F. 105 mm.; P. segs. 33 mm., white; C. lgth. 20 mm., C. diam. 25 mm., white. D11B (Easter Moon × Vigil)
- Yosemite (Evans) 2c; midseason; H. 17"; F. 4¾"; P. segs. 1⅞", white; C. lgth. 1¾", C. diam. 1½", white. C-138 (Radiation × (Trousseau × Pink of Dawn))

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