



A MULTIDISCIPLINARY APPROACH
TO HISTORIC LANDSCAPES
RESEARCH

HISTORIC
DAFFODILS AT
WINTERTHUR

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SUMMER SCHOLARS 2019



PROJECT BACKGROUND

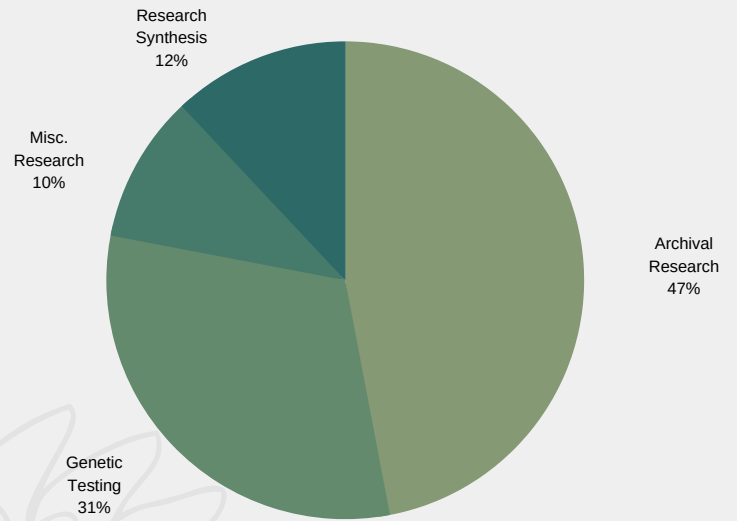
In 1914, Henry Francis duPont assumed responsibility for the Winterthur Estate. duPont quickly began enlarging the garden in the "wild garden" style, a large component of which is the March Bank, a naturalistic planting of spring bulbs. This included daffodils, a flower for which duPont proved to have great passion - he even published an article on them in 1924. Today, many of Winterthur's daffodil specimens are considered "historic" cultivars, as they were registered with the Royal Horticultural Society before 1940 - indeed, our research proved many cultivars were in the garden from the early 1914, when H.F. DuPont took control of the estate.

Taking this into account, our research goals were two-pronged. Firstly, we wanted to use archival and photographic documentation to determine which cultivars, or varieties, of daffodils were present in the garden, their locations, and develop a plan to increase their presence in the current garden. Secondly, we wanted to develop a protocol to identify daffodil cultivars using genetic sequencing. This summer, we made very good headway into both these goals, and have a plan on how to go further.



HOW MY TIME WAS SPENT

This summer, I spent approximately 105 hours on this project. Almost half of that time was spent in Winterthur's archives, sorting through 72 boxes of correspondence, order forms, and photographs related to daffodils at Winterthur. I also spent a significant amount of time running PCR and gel electrophoresis on daffodil samples



1903

Earliest mention of *Narcissus* in Winterthur's archival materials

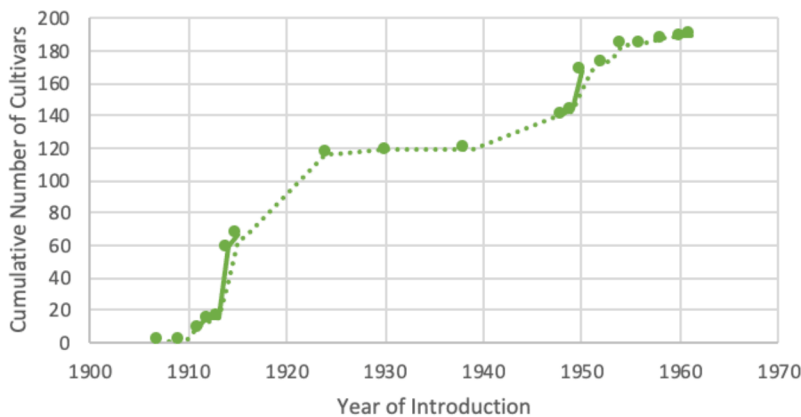
227

Unique *Narcissus* cultivars present at Winterthur at some point since 1907

54

Historically documented *Narcissus* cultivars still present at Winterthur

Introduction Dates of *Narcissus* Cultivars to Winterthur



INTRODUCTION DATES

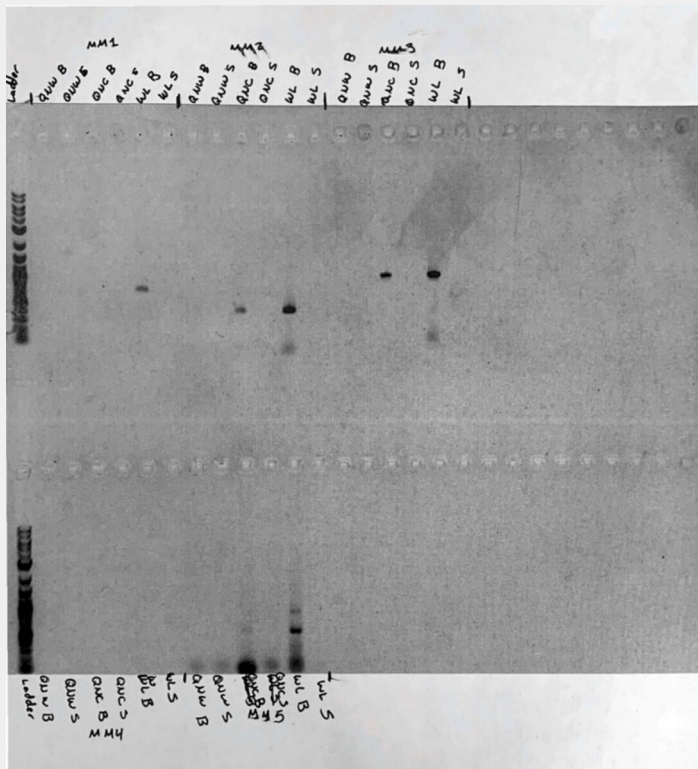
While the introduction dates of 36 cultivars were unable to be determined - none of the documents in which they were mentioned were dated - a majority of the cultivars could be dated using original purchase records or correspondence. A majority of cultivars were introduced between 1920 and 1930, a time period in which they were quickly becoming popularized in the United States.

OUR GENETIC RESEARCH

Because *Narcissi* are cultivated as bulbs, it is difficult to determine cultivar identity prior to their flowering. Seeing this, we sought to isolate the DNA of two virtually identical cultivars - Narcissus Queen of the North and Narcissus White Lady - and conduct PCR using five different primer sets, with the goal of finding a specific segment of DNA which can be used to distinguish cultivars.

This mission came with many unique challenges. Because the bulbs are dormant in the summer, we had to isolate DNA from bulb and epidermis tissue, both of which are inferior in genetic quality compared to leaf tissue. Moreover, as *Narcissi* are not been sequenced, we had to play around with five primer sets to figure out which was best.

Below, you will see the most recent run of gel electrophoresis. We had three samples - Queen of the North from Winterthur (QNW), Queen of the North from Clenny Run (QNC) and White Lady from Winterthur (WL). We used tissue from bulbs (B) and epidermis (S). Primer sets 1, 4, and 5 did not run successfully, but 2 and 3 did. The samples from QNC and WL appear similar. Further iterations of the experiment will occur into the fall.



Primer	Sequence	No. cycles, annealing temperatures and elongation times
<i>ndhF</i>	1318: 5'-GGATTAAC(CT)GCATTTTATATGTTTCG-3'	95 °C for 5 min, 37 cycles, 51 °C for
	2110: 5' -CCCCCTA(CT)ATATTTGATACCTTCTCC- 3'	1 min, 72 °C for 7 min
<i>matK</i>	F: 5' -TCCCATCCATATGGAAATCTTGGT- 3'	95 °C for 5 min, 34 cycles, 50 °C for
	CR: 5'-TCCTGTACGGTTGAGACCAAAAGT- 3'	1 min, 72 °C for 2 min
<i>cob</i>	P1: 5'- AGCATTTGATAGATTATCCAACC- 3'	95 °C for 5 min, 30 cycles, 50 °C for
	P6: 5' -ATTCCTCTTCCAACCTCGTCC- 3'	30 sec, 72 °C at 10 min
<i>atpA</i>	F1: 5'- AAGTGGATGAGATCGGTCGAG -3'	95 °C for 5 min, 35 cycles, 57 °C for
	B1: 5'- GGCAATTCGATCACAGA -3'	30 sec, 72 °C at 7 min
ITS	AB101: 5' -ACGAATTCATGGTCCGGTGAAGTGTTTCG -3'	95 °C for 5 min, 38 cycles, 52 °C for
	AB102: 5'- TAGAATTCCTCCGGTTCGCTCGCCGTAC -3'	30 sec, 72 °C at 10 min

Table 1 - Primer Sets Used

ARCHIVAL RESEARCH

As mentioned above, a majority of my time was spent in the Winterthur Estate's archives, reading through the personal papers of Henry Francis duPont. This was a time-consuming effort - duPont was meticulous in his record keeping (something for which I, as a historian, am very grateful). In the fifty four archival boxes I went through, I came across countless purchase receipts from daffodil growers, personal correspondence between duPont and associates across the globe, and boxes of old catalogs.

By far, the most stand-out piece I found in the archives was an article Mr. duPont wrote in 1937 for the American Daffodil Society's annual yearbook about his naturalized daffodils. This article is attached as Appendix B. Running at nearly ten pages, this article not only details specific species present in the garden at the time, but also his opinions on arrangements and garden plans.

While this was an exciting find, the more "mundane" documents - mainly the aforementioned purchase receipts and order forms - which constituted the backbone of my research. Those documents allowed me to see which Narcissi came into the garden when, and the quantities purchased. Sometimes, these documents would also show planting locations.

One interesting finding was that duPont would often plant daffodils in his vegetable garden - but only in quantities of one or two. This supports the fact that duPont took his gardening seriously - he would use the vegetable garden to test out new or expensive varieties, while the more popular ones - Golden Spur, for instance, would be placed across the estate by the thousand.



PHOTOGRAPHIC RESEARCH



*Narcissi along
Clenny Run,
undated*

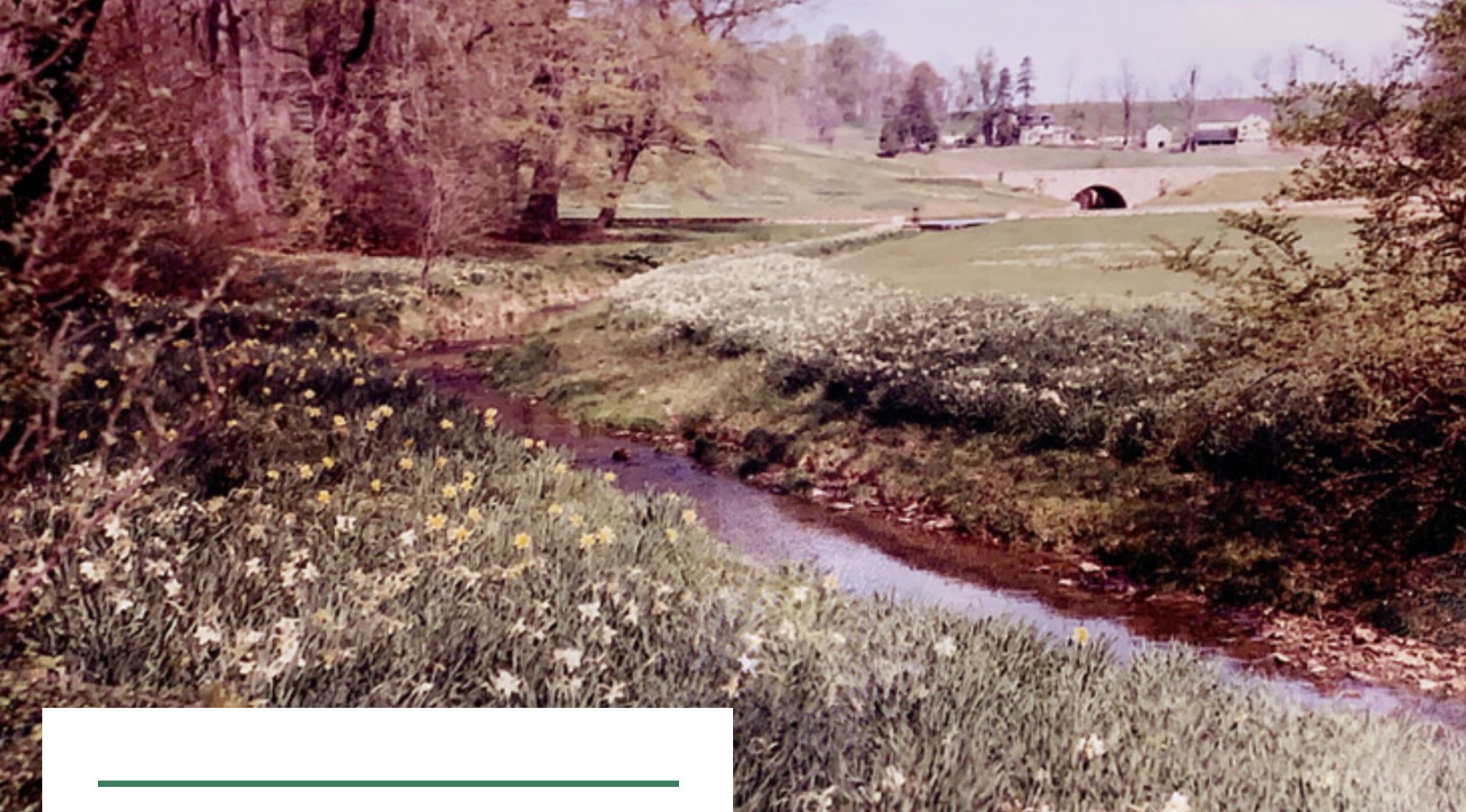
*Sycamore Hill,
undated*

*The Narcissus
grove, undated*

Towards the end of my archival research, I went through estate photographs and photo negatives in the archives. While it was impossible to determine which cultivars were in the garden from the photographs - all were broad landscapes, not specimen photos - they did help clear up a few questions we had in researching

Firstly, they helped solidify the location of the old *Narcissus* grove. duPont's notes simply refer to "the *Narcissus* grove at the front of the house," but with Winterthur's labyrinthine structure, this location was hard to determine. However, photos showed this to be on the side of the house with the poplars, in front of the conservatory.

Secondly, the photos were integral in identifying the location of the "Scotch Border," an area of the garden with a considerable amount of *Narcissi*, which I found mentioned in a 1924 garden inventory - and no where else. Along with the aforementioned *Narcissus* grove and Sycamore Hill, the existing *Narcissus* garden, this area had the largest amount of daffodils, and yet no one associated with the garden had heard of it. The photos seem to support the conclusion that the "Scotch Border" is likely the area around Clenny Run, a stream on the estate.



NEXT STEPS

This summer was spent gathering raw data, both scientific and historic. The amount of information is almost overwhelming, but the historic daffodil community seems very supportive of the project.

Our next step is to continue future iterations of our study. We plan on doing further DNA isolation with the addition of DMSO, in order to make the DNA more accessible. Once we get good samples of both our Queen of the North and White Lady samples - as evidenced by PCR after gel electrophoresis - we plan on sending them off for full sequencing. We hope to identify a specific segment of DNA to differentiate cultivars, which we will test on bulbs that have been sent from gardens all across the country.

Once we have results that we deem to be successful, we plan on synthesizing our results into a form that is readily publishable. I have already begun synthesis of the historic portion, but as the genetic research is a key point, it cannot be published until that is complete.



Bibliography

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- Van Beck, Sara L. 2015. *Daffodils in Historic American Gardens, 1733-1940*. Columbia, South Carolina: University of South Carolina Press.

Appendix A - Daffodil Cultivars Historically Present at Winterthur

Cultivar	Earliest Introduction	Initial Quantity	Purchased From...	Initial Purchase Cost	Location (1)	Location (2)	Still In Garden?	Current Location	Comments
Barii Dorothy E. Weymuss	1907	12	Barr and Sons		Scotch Border (1924)		No		
Golden Spur	1909	1000	Jackson and Perkins	\$13.50	Forced in house (1914)	Path (1914)	No		
Leedsii Diana	1911	Unk	Barr and Sons	\$8.60			No		
Lobularis	1911	650	Barr and Sons		Bank to Bend (1912)		No		
Pallidus Praecox	1911	100	Barr and Sons	\$8.60			No		Now N. Pseudonarcissus 'Major Pallidus'
Grandee	1912	800	Van Tubergen		Forced in house (1914)		No		
Paperwhite	1912	300	Van Tubergen		Forced in house (1914)		No		
Victoria	1912	150	Van Tubergen		Forced in house (1914)		No		
Autocrat	1914	1600	Van Tubergen				No		
Barii Cresset	1914	1	Barr and Sons				No		
Barii Firebrand	1914	100	Van Tubergen		Scotch Border (1924)		No		
Barii Hyacinth	1914	50	Barr and Sons				No		
Barii Mascotte	1914	12	Barr and Sons				No		
Barii Pinella	1914	2	Barr and Sons				No		
Barii Rosalind	1914	12	Barr and Sons				No		
Barii Rosella	1914	12	Barr and Sons				No		
Barii Sea Bird	1914	2	Barr and Sons				No		
Barii Siddington	1914	50	Barr and Sons				No		
Barii Sir Lancelot	1914	1	Barr and Sons				No		
dbl. incomp. Stella Superba Butterfly	1914	100	Van Tubergen				No		
dbl. Incomparabilis Primrose Phoenix	1914	50	Van Tubergen				No		
Excelsior	1914	25	Barr and Sons				No		
Fairy	1914	345	Van Tubergen				No		
incomp. Citriana	1914	1	Barr and Sons				No		
Incomp. Commodore	1914	200	Van Tubergen				No		
incomp. Double Plenips	1914		100		Cutting		No		
incomp. Gaiety	1914	1	Barr and Sons				No		
incomp. Vesuvius	1914	10	Barr and Sons				No		
Incomp. Will Scarlet	1914	10	Van Tubergen		Vegetable Garden (1924)		No		
Incomparabilis 'Firelight'	1914	650	Barr and Sons	\$114.40	Narcissus Grove		No		
Incomparabilis 'Plentipo'	1914	100	Barr and Sons	\$30.00			No		
Incomparabilis Frank Miles	1914	325	Van Tubergen				No		
Incomparabilis Gloria Mundi	1914	220	Van Tubergen				No		
Incomparabilis Princess Mary	1914	625	Van Tubergen				No		
Jonquillus Rugulosis	1914	100	Van Tubergen				No		
Jonquillus Rugulosis plenus	1914	100	Van Tubergen				No		
Leedsii Duchess of Westminster	1914	50	Barr and Sons				No		
Leedsii Polestar	1914	100	Barr and Sons				No		
Nanus pallidus	1914	50	Barr and Sons				No		
Poeticus Cassandra	1914	100	Van Tubergen				No		
Queen of Spain	1914	650	Van Tubergen				No		
Robert Browning	1914	50	Van Tubergen				No		
Triandus Hybrid Cingalee	1914	1	Barr and Sons				No		
Bennett Poe	1915	12	Cartwright and Godwin				No		
Capax Plenus	1915	12	Cartwright and Godwin				No		
Christmas Trumpet	1915	100	AT Bodington				No		
Felicity	1915	12	Cartwright and Godwin				No		
Horsfieldi	1915	300	Van Tubergen		Grove (1914)		No		
Mountain Maid	1915	12	Cartwright and Godwin				No		
Poeticus Ornatus	1915	1200	Van Tubergen		Mertensia Bank (1912)	Across Path (1914)	No		
Antigone	1924	50			Vegetable Garden (1924)		No		
Barii Bullfinch	1924	1			Grove (1924)		No		
Barii Circlet	1924	10			Vegetable Garden (1924)		No		
Barii Elizabeth Ryan	1924	20					No		

Cultivar	Ealiest Introduction	Initial Quantity	Purchased From...	Initial Purchase Cost	Location (1)	Location (2)	Still In Garden?	Current Location	Comments
Barii Glitter	1924	100			Scotch Border (1924)		No		
Barii Harpagon	1924	1			Scotch Border (1924)		No		
Barii Leonie	1924	250			Scotch Border (1924)		No		
Barii Masterpiece	1924	200			Grove (1924)		No		
Barii Peveril	1924	50			Grove (1924)		No		
Barii Red Beacon	1924	50			Grove (1924)		No		
Barii Southern Star	1924	50			Scotch Border (1924)		No		
Commandant	1924	25			Vegetable Garden (1924)		No		
Cyclamen Orange Glory	1924	1			Scotch Border (1924)		No		
incomp. Croesus	1924	1			Grove (1924)		No		
Incomp. Edrin	1924	50			Grove (1924)		No		
incomp. Epicure	1924	20			Vegetable Garden (1924)		No		
Incomp. Holbein	1924	20			Vegetable Garden (1924)		No		
incomp. Jeanette	1924	2			Grove (1924)		No		
incomp. Lady Arnott	1924	3			Vegetable Garden (1924)		No		
incomp. Macebearer	1924	10			Vegetable Garden (1924)		No		
incomp. Orange Buffer	1924	300			Grove (1924)		No		
incomp. Whitewell	1924	50			Scotch Border (1924)		No		
Lady Audrey	1924	50			Scotch Border (1924)		No		
Leedsii Moonbeam	1924	3			Scotch Border (1924)		No		
Leedsii Czarina	1924	2			Grove (1924)		No		
Leedsii Evangeline	1924	200			Scotch Border (1924)		No		
Leedsii Fairy Queen	1924	100			Scotch Border (1924)		No		
Madame de Graaff	1924	200			Vegetable Garden (1924)		No		
Morning Glory	1924	2			Scotch Border (1924)		No		
Peter Barr	1924	3			Vegetable Garden (1924)		No		
Poetas Admiration	1924	50			Vegetable Garden (1924)		No		
Poetas Haemon	1924	50			Vegetable Garden (1924)		No		
Poetas Mignon	1924	50			Vegetable Garden (1924)		No		
Yellow Queen	1924	50			Vegetable Garden (1924)		No		
Laurens Coster	1930	500	Ohms				No		
Orange Cup	1930	500	Ohms				No		
Crystal Queen	1948						No		
incomp. Folly	1948						No		
incomp. Invincible	1948						No		
Irene Bordoni	1948						No		
Kilter	1948						No		
Laiglon	1948						No		
Pearly Queen	1948						No		
Scarlet Leader	1948						No		
Kenmare	1949	6	J. Lionel Richardson				No		
Rose of Tralee	1949	2	J. Lionel Richardson				No		
Bann	1950						No		
Burgomaster Gouverneur	1950						No		
Corrymeela	1950						No		
Flora Favorite	1950						No		
Graphic	1950						No		
Interim	1950						No		
Loch Maree	1950						No		
Loveliest	1950						No		
Marion O'Neill	1950						No		
Merape	1950						No		
Moylena	1950						No		
Moylena	1950						No		
Par	1950						No		
Pink Ron	1950						No		
Rosario	1950						No		
Rustom Pasha	1950						No		
Sunnybrook	1950						No		
Topic	1950						No		
Tressambly	1950						No		
Armada	1952		JM deNavarro	gifted			No		
Revelry	1952		JM deNavarro	gifted			No		
Scotch Rose	1952		JM deNavarro	gifted			No		

Cultivar	Ealiest Introduction	Initial Quantity	Purchased From...	Initial Purchase Cost	Location (1)	Location (2)	Still In Garden?	Current Location	Comments
April Tears	1954	1	Grant E. Mitsch	\$1.00			No		
Balmoral	1954	1	Grant E. Mitsch	\$0.45			No		
Cheyenne	1954	1	Grant E. Mitsch	\$0.50			No		
Clackmar	1954	1	Grant E. Mitsch	\$0.20			No		
Crocus	1954	1	Grant E. Mitsch	\$0.35			No		
Glenshane	1954	1	Grant E. Mitsch	\$0.55			No		
Hiawassee	1954	1	Grant E. Mitsch	\$0.80			No		
Malvern Gold	1954	1	Grant E. Mitsch	\$0.35			No		
Narvik	1954	1	Grant E. Mitsch	\$1.50			No		
Rogue	1954	1	Grant E. Mitsch	\$0.35			No		
Martha Washington	1958	12	NYBG	\$2.30			No		
Renee Donaldson	1961	1	Ohms	\$12.50			No		
Pink Horizon	By 1948		JM deNavarro	gifted			No		
Green Island	By 1949						No		
Matapan	By 1949		JM Navarro	gifted			No		
Pink of Dawn	By 1949		JM deNavarro	gifted			No		
Samite	By 1949						No		
Alice Knight							No		
Bedoir		25					No		
Blood Orange							No		
Buttercup							No		
Cardinal							No		
Cossack							No		
Dorothy							No		
Duke of Bedford		1	Barr and Sons		In Pots		No		
E. Silphureum							No		
Edwin							No		
Felice							No		
Finella							No		
Florizel							No		
Gracilis							No		
Hecote							No		
junctiflorus		100	Barr and Sons				No		
Lemon Frill							No		
Lord Roberts		1	Barr and Sons		In Pots		No		
Lucivious							No		
Lulworth Beauty							No		
Marvellie							No		
Mascotte							No		
Minnie Hume							No		
Miss B. Hysinth							No		
Mrs. Robert Browning							No		
Music							No		
Queen Bess							No		
Rosalind							No		
Royal Lady							No		
Santa Maria		100	Barr and Sons				No		
Seaburry							No		
Sir Lancelot							No		
Sissington							No		
White Queen							No		
Whitewell							No		
Junctifolius	1911	100	Barr and Sons	\$6.60			Yes	Quarry Garden	Now N. jonquilla
minimus	1911	100	Barr and Sons				Yes	March Walk	
minor	1911	400	Barr and Sons		Bank to Bend (1912)		Yes	March Walk	
nanus	1911	12	Barr and Sons		Bank to Bend (1912)		Yes	Enchanted Woods	
Emperor	1912	200	Van Tubergen		Forced in house (1914)		Yes	Azalea Woods, Golf Course	
Princeps	1912	500	Van Tubergen		Forced in house (1914)		Yes	Greenhouse Area	
obvallaris	1913	50	HH Berger Co.				Yes	Greenhouse Area	
Barii Conspicuous	1914	200	Van Tubergen				Yes	Sycamore Hill	No 'Barii' anymore
Barii Seagull	1914	100	Barr and Sons	\$17.60	Trial		Yes	Cutting Garden	No 'Barii' anymore
Blackwell	1914	50	Barr and Sons	\$31.67	Narcissus Grove		Yes	Main Drive	
incomp. Lady Bird	1914	6	Barr and Sons				Yes	Golf Course	
Incomparabilis 'Lucifer'	1914	125	Barr and Sons	\$52.50	Narcissus Grove		Yes	Museum	
Princeps improved	1914	25	Barr and Sons				Yes	Greenhouse Area	
Spring Glory	1914	12	Barr and Sons				Yes	Unknown	
Poeticus	1915	50	Van Tubergen		Path (1914)		Yes	Golf Course, Main Drive	

Narcissus

Appendix B - HF DuPont's 1937 Essay

Of the many gardens one can have, there are none which,

once planned and planted, give more satisfactory results with as little upkeep as the one in which Narcissus predominate. The initial cost, other than the price of the bulbs, is a negligible one, no grading, sub-draining, wall-building, etc., being needed. An open wood-lot, preferably one with a gentle slope which has been cleared in part of its underbrush, and you have the fundamental requirements of your garden. If one is blessed with a background of evergreens, trees or shrubs, such as Healecks, Arbor Vitae, Kalmias or Rhododendrons, etc., with Cornus mas, Viburnums, and Spicewood in the foreground, and Virginia Cedars here and there among the forest trees in the open, even better effects can be obtained; but with simply the contrast of the bare trunks of the trees and an undergrowth of spice bushes and wild Viburnums edging the adjacent woods, quite lovely results can be had.

In such a locality as I have described, the paths soon become moss-grown, and require but an occasional scything; the weeds among the bulbs are comparatively few, and once the bulb foliage has died away your garden is indistinguishable from your woodland. If one is troubled with field mice, it is wiser to rake away the leaves of the trees after the majority have fallen in the autumn, and this must be done again in the early spring before the bulbs have started their growth, so that each plant may have a chance to develop evenly.

The lay-out, width, and arrangement of the paths vary so much in each individual situation that it is hardly worth while even to generalize on the subject. The width of my main paths is 5 ft. 6 in., and seems fairly successful; but there are also many spaces

- 2 -
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of varying width where one can walk about and around the bulbs.

Having made up one's mind about the location of the paths, the problem of bulb planning and planting confronts us. The general advice in catalogues and elsewhere is to scatter the bulbs over the ground broadcast with the hand, planting them where they fall. In practice, however, it is difficult to do this over any large area and keep the relations of the various groups and masses in one comprehensive whole, and I find it much simpler to first outline my plantations with fallen twigs and branches picked up in the wood. These are found in various lengths and shapes, and after removing the side shoots give all the regularity or irregularity of contour one could desire. When the large plantations have been laid out, it is a simple matter to connect them by dropping a few bulbs here and there where they seem to be required.

As for the actual planting, I use an ordinary trowel or a mattock, it is much quicker than a bulb planter, and I allow enough space for each bulb to increase and still remain undisturbed for several years, at least 6" apart. For the great pleasure in a bulb garden is in its permanency, as the first spring after planting, no matter how thickly the bulbs may have been put in, there is a certain bareness about the soil which is detrimental to the best effect, while even the medium-sized trumpet varieties have a certain fulness and regularity of bloom which suggests the more formal garden. Happily, this defect occurs only in the first season; but nevertheless the short-cupped sections are the most pleasing for naturalizing in large woodland areas. If, however, your wood-lot adjoins the lawn, a few Trumpet Narcissi in the foreground make a lovely effect, and in this connection I can recommend bicolor *Forsfieldii*

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most highly. Year after year it blooms profusely, and has never yet failed me. Mine have been undisturbed for thirty years, and so have my Grandee, which lengthen the same general effect of color by their successive period of bloom, though of course their blooming periods overlap - are meant to. F. R. Barr is a very good trumpet to combine with Horsfieldii and Grandee as it is more yellow in tone than the other two and makes a very good contrast with them. For in naturalizing large groups one must have deeper and lighter shades, and F. R. Barr has a most pleasing yellow color. Moreover, I have found very few good mid-season yellow for permanent naturalizing, and as for the earlier yellows, even Golden Spur can't be depended upon in all localities. A few bulbs here and there will last for years but they cannot always be depended upon in a mass. Emperor and Empress Victoria are all good naturalizers but to my mind are too big and coarse to look well with the short-cupped sections in the woodland, but are splended in meadows.

A pretty good rule to follow in all bulb planting is to have the earlier bulbs in an entirely separate location from the others, as with our sudden hot waves they spoil the main effect by their early fading, and no late blooming bulb is too late to put with the mid-season varieties as the very hot early days make them overlap invariably. The Poeticus section should be kept to a separate locality as its white color looks almost blue in contrast to the cream whites of the Trumpets, Leedsii, Barri, and Incomparabilis. In this connection, the so-called cheap mixtures for naturalizing in grass should be avoided as the result will be a jumble of Poeticus, Trumpets, the

double varieties, and all the other kinds, which together, to me, are a perfect nightmare. Always plant the varieties separately. This is one of the essential and all important lessons the intending planter must learn, as there can be no comparison as to the more pleasing effect of a bold expanse of one variety and of a mixture.

If one is going to naturalize Narcissi in meadows or lawns there are certain things one must learn before planting them, viz., do not plant them any place where the grass has to be cut before the middle of June, hence avoid planting them too close to lawns or flower beds, or in front of neat shrubberies, where long grass would be unsightly in May or June, for if the leaves are cut too early the bulbs deteriorate, and if the leaves are cut one or two years during April or May it will not be long before the bulbs have all disappeared.

I mentioned a few moments ago some of the trumpet varieties which naturalized well with me, but to be perfectly safe it is wiser to try out every new kind for three years before planting them extensively. I have always done so, and that is why as a whole my Narcissi garden is fairly successful. The secret of a successful big planting of Narcissi is, first, have only varieties that bloom at about the same time - never more than one week's difference, have them of contrasting form and shades, and have your patches of pleasing shapes and sizes. Some bulbs, moreover, last in bloom much longer than others. Incomparabilis Commodore for that reason to me is invaluable. It is a most pleasing soft yellow, with very distinctive large round petals, is among the first to bloom and lasts fully three weeks, and is a challenge to any other narcissus, and during the past thirty years has bloomed freely each year.

Of the short-cupped Narcissi that are reasonable enough in price to naturalize, the following I have found most satisfactory: Autocrat, Incomparabilis - this is one of the few all yellow short-cupped Narcissi which keeps its color to the very end. It is splendid for contrast.

Frank Miles, Incomparabilis, is also another yellow which keeps its color without fading. Although the flower is much smaller, it is quite easy to pick out among the groups as its perianth has a starry form and is quite wavy. Frank Miles is not quite as free a bloomer as Autocrat.

Gloria Mundi, Incomparabilis - This has a primrose-yellow perianth, cup dark chrome at base deepening to brilliant orange-red at rim. Unfortunately, this brilliant coloring fades out in a few days, but still this does not detract from the good yellow effect which lasts till the end. The foliage is quite a distinct grey-green. Blackwell, Incomparabilis - this flower is very much the same coloring as Gloria Mundi but it is a little bit more brilliant all the way through and the cup is fairly straight and long.

While the last two flowers are distinctly on the yellow coloring, with orange cups, the next four are more on the white shades with brilliant orange red cups, viz:

Lulworth Beauty, Incomparabilis - This has a cream white perianth; cup bright orange-red.

Will Scarlet, Incomparabilis - Very much the same coloring except that the cup is very large and striking. The flower head droops a bit, but the orange cup makes such a beautiful note that one cannot possibly get along without it in a big collection.

Firebrand, Barrii - Creamy white perianth; cup intense fiery red. It is as trig and prim looking as Will Scarlet is floppy and loosely put together

Lucifer, Incomparabilis - This is still another one with white perianth and orange cup, but not quite so intense as the last two and is a good transition to use to work into the yellows again

Sir Watkin, Incomparabilis - Primrose perianth and yellow cup. A very large flower which is very reliable as to blooming qualities but it soon passes into a paleish yellow of no particular distinction and cannot be depended upon to make an accent among other colors.

Conspicuous, Barrii - A splendid doer, with a broad yellow perianth and a short cup with bright orange scarlet edge when it first expands.

Princess Mary, Incomparabilis - Opens with a pale primrose perianth which soon fades to white, with a good, flatly expanding yellow cup.

Whitewell, Incomparabilis - Very striking flower with flat creamy white perianth and large open cup of deep chrome-yellow. Whitewell can always be counted upon for accentuation, and for 18 days of bloom.

Seagull, Barrii - Broad perianth of purest white and splended substance; pale yellow cup. A lovely flower, which also stands out well.

These three Leedsii's are very reliable:

Mrs. Langtry - A small flower but very free flowering. Effect is pale primrose to white.

Duchess of Westminster - More of a bicolor in effect than Mrs. Langtry.

Queen of the North - A perfectly lovely flower of great distinction. Broad large white perianth, soft yellow or primrose cup. Flower which is very clear in color.

If you will check up my list you will see that I have only mentioned a very few different varieties, but all the ones I mentioned I find absolutely reliable as to blooming qualities, and different to the general casual observer as to color. I frankly admit that I have many more kinds, but I am not mentioning them here because they are either too expensive or not distinctive enough for the average person who does not specialize in Narcissi. Almost anyone can notice the difference in color, shape and effect of the ones I have named, but when you come to a great many of the others it takes more or less of a specialist to notice the difference. For those who want to try a very few choice things, bulbs sometimes costing from \$1.00 to \$2.50 apiece, I should advise the following, although I am not sure how they will naturalize:

I must not forget to mention the lovely white trumpet daffodil Madame de Graaff, an exquisite flower, and by far the best white for naturalizing; and also there is a perfectly enchanting daffodil Queen of Spain, a wild hybrid discovered by the late Mr. Peter Barr in Spain. Both the cup and the perianth are of a uniform, soft, delicate, clear yellow, with a gracefully reflexing perianth, trumpet of distinct and elegant form. A most lovely little flower which should be planted by itself. If planted in front of the new Daphne Jenquo it makes a most charming combination of pure yellows and mauves.

Cingalee - Hybrid Queen of Spain. Much larger flower than Queen of Spain. Has a clear primrose trumpet, and rather a large perianth, cream colored, with a primrose line at the back of each petal. A lovely flower to look upon.

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- CONSPICUOUS, Barrii. Large, broad, spreading perianth of soft yellow; short yellow cup, edged bright orange-scarlet. One of the most useful of all Daffodils. Splendid for the border or naturalizing, and superb for midseason forcing. Height 21 in.
- CROSSUS, Incomparabilis. Pale primrose perianth with thick overlapping petals; wide expanded crown of great size, heavily suffused and stained deep orange-red. A flower of great substance, and one of the very finest things of recent introduction. Height 17 in.
- CZARINA, Giant Leedsii. Pure white perianth with long, pointed petals beautifully twisted but overlapping at base; pale lemon crown, rather whiter outside and exquisitely frilled. A very decorative flower and superb in the garden. Height 15 in.
- EBE GRACE, Giant Leedsii. Milk-white perianth with long, pointed petals noticeably ribbed; cup soft primrose-yellow passing to white at edges and exquisitely frilled. A flower of almost transparent quality and erect habit. Height 12 in.
- JEANETTE, Giant Incomparabilis. Perianth and cup, lemon.
- ORANGE GLORY. Cy. Hybrid, but late like
Deepest intense orange.
- PETER BARR, White Trumpet. White perianth of rather loose and spreading form; huge trumpet of pale ivory-white, very long and beautifully recurving at brim. A flower of exquisite symmetry, fine substance and very noble character; one of the largest white Trumpets; strong grower and free bloomer. Height 15 in.
- WHITE QUEEN, Giant Leedsii. Broad, overlapping perianth of glistening white, with pointed petals; bold, straight crown of soft lemon, passing into white with age. A very large but refined flower of great substance; one of the first of the type, and still one of the best. Height 15 in.

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There are also excellent smaller trumpet varieties, such as Minor Nanus, and the tiny Minimus, all quite charming in their association with Crocuses, Chionodoxas, Muscari, and numerous other small bulbs and early-flowering plants. Minor is on the regular daffodil type, but is a little low short fellow. Minimus has bloomed as early as March 1st, and Minor some two weeks later.

The Rev. Joseph Jacob, a great English bulb authority, has kindly sent me the proof sheets of his chapter on narcissi in the new bulb book he is publishing, and I wrote him I would take great pleasure in reading to you some of it.

Perhaps some of you are interested in the time of bloom of my narcissi garden: March 26th is the earliest date when the garden has been in full bloom, but usually the height of bloom is from April 16th to 26th.

Before I close let me remind you that this coming autumn will be the last time one can import narcissi without a permit, which means endless red tape and very often disappointment, as they are rather hard to obtain. So if any of you have any intentions of ever having some lovely plantations about your houses, the time to order the bulbs is now, this coming spring. If your grounds are not ready or if you are undecided upon the exact location, plant them somewhere in rows. In a year or two you can dig them up and put them in their permanent position, and I truly hope that you will not put more than one variety of flower in one special group, and whether you plant large or small areas, group together those varieties which bloom at about the same time, thus assuring a perennial gratification in an unfailling scheme of contrast and combination of color.

I have some colored prints here that you might like to see,