
Plant Behavior and an Evaluation of the Glenn Dale 'Conquest'

William C. Miller III

Bethesda, Maryland

One of my major interests in azaleas is plant behavior. From conversations with many of you over the years, I know we all have seen things in our azalea gardens that have piqued our curiosity. I believe these physical manifestations of "something different," labeling errors aside, are the result of environmental influences on genetic potential. In other words, the perceived changes in flower hue from year to year, the propensity to sport, the variability of new growth length (spikes) in otherwise compact plants, and the amount of petaloidy on semi-double cultivars are variable characteristics that are modulated by the amount and timing of rainfall, nutritional factors, the timing of hot and/or cold weather, and the intensity and duration of sunlight. This variable behavior goes on all the time, but it is often not pronounced and therefore not always recognized. Before we can understand how the environment causes change, however, we need to better understand hybridizing and the heritability of characteristics from one generation to the next. It would be useful if we could establish, in quantifiable units, what constitutes a phenotype (that which we see) and what constitutes a departure from that basic standard. Only then can we distinguish between normal variation and "mistakes" (from propagation bench and distribution errors to carelessness and outright fraud) and recognize true departures from expectation that are attributable to forces other than chance (e.g., the relating by typographical error of genetically unrelated plants).



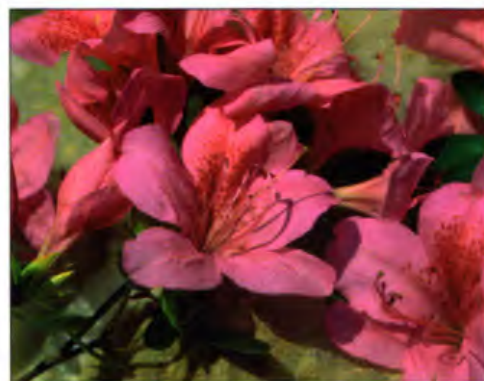
'Jubilee'



'Ursula'



'Conquest'



'Illusion'



'Bagdad'



'Mandarin'



'Gaiety'

With the above introduction, my phone rang one evening not too long ago. It was Jane Newman, a friend in the Northern Virginia Chapter who lives in Great Falls, Virginia, a short distance just across the Potomac River from me (1). She knew of my interest in and study of the Glenn Dale hybrids, which resulted in the publication of *The Bell Book* (2) in 1994 and *The Glenn Dale Azaleas Revised* (3) in 1996, and was calling with a request that I look into a question that she had. Jane was concerned that 'Conquest' is described as a white-with-stripes flower, while its parents and sister seedlings are self-colored. Her hope was that white-with-stripes 'Conquest' was some kind of mistake, a typographical error or perhaps a mixup in propagation or shipping. She had acquired 'Conquest' from five different sources over the years and each specimen was self-colored and did not match the official description. Her question had merit, so I agreed to undertake a review. This was an opportunity to evaluate what we knew about azalea behavior in general with the data we had on 'Conquest', its parents, and its sister-seedlings. The balance of this article consists of the information that I reported back to Jane with minor elaborations.

The first thing I did was to construct a table of the available information (Table 1) to see if any of the data looked unusual. I could not find any indication of the size of the population derived from seed lot 38972. There could have been anywhere from five to several hundred seedlings from which only these five sister-seedlings weathered the selection process. We really do not have much to go on, since we do not know what they discarded or chose not to select. In fact, these five could poorly represent the population as a whole. That is another way of saying that we have very limited insight into what the cross ('Illusion' x 'Gaiety') really produced. If we could determine that they discarded a lot of white-with-stripes, then we would know more about the genetic make up of 'Illusion' and 'Gaiety', and we

would not pursue this further. My guess is that they would have been looking for unusual things or something other than that of which they already had a lot. I would have thought that the selective pressure would have been against white-with-stripes due to the 'Vittatum' work done earlier, but I am reminded of the fact that they revisited B32140 near the end of the project and selected 'Cinderella' and 'Satrap', both white-with-stripes. Morrison makes special reference to B32140 in the Observations section of Monograph 20 as the "most unusual striped flower" (4, 5). In any case, I think it is fair to say that WWII interfered with the selection process. Neither the Bell Numbers nor the Plant Introduction Numbers for these five are sequential, and there are gaps which would seem to indicate other related plants that were not selected. With the available documentation, I have no basis for questioning the official description for 'Conquest'.

Next I reviewed Galle's book *Azaleas*, Appendix C (6). Color in azaleas is a dominant characteristic. Purple is dominant over purplish red. Purplish red is dominant over red. Any color is dominant over white. White, or the absence of color, is a homozygous recessive characteristic. So a flower carrying the purple gene would be white if it also carried two genes for white. In other words the color is there, but it just is not expressed. On page 408 of *Azaleas*, Galle (or Heursel and Horn) cites 'Ledifolium Album' as an example. When a red azalea was crossed with 'Ledifolium Album', all of the resulting progeny were purple rather than red. That is because 'Ledifolium Album', as white as it is, is really a purple flower. Just exactly where stripes, sectors, and sanding fall in this model I do not know. I note in Morrison's Observations section of Monograph 20 that he grouped whites and striped whites together when discussing color distribution.

Heritability of color in azaleas is not all that simple. We would have to know a lot more about the genetic make-up of both 'Illusion' and 'Gaiety' before we could conclude that a white or a white-with-stripes was not possible. Toward that end, I reviewed the sister seedlings of 'Illusion' and 'Gaiety', 25 and 23 individuals, respectively. While my review did not turn up a white or white-with-stripes flower, I am still not concerned for the same reasons stated above. We would have benefited from knowing what they discarded.

Looking at the question another way—for 'Conquest' to be correct, 'Illusion' and 'Gaiety' both have to be carriers of the white gene. In a theoretical group of progeny, derived from two white gene carriers and untouched by human selection, 25% of the progeny could be expected to be white flowers. The example, 'Paul Schame' x 'Avenir', appears at the top of page 407 in Galle's book *Azaleas*.

A final issue that we must consider when faced with existing plants that are inconsistent with official descriptions is the very serious problem of careless propagation. At any level of the market (including the hobbyist), the damage can be catastrophic because the ultimate effect downstream is logarithmic. With each passing year, a propagation error gets bigger and more difficult to correct. We know that Morrison recognized that the careless propagation of a white-with-stripes cultivar could result in a wide range of sports (including self-colored sports) being marketed under the same cultivar name (7). His approach was to recommend that self-colored sports be removed so that the cutting wood would not be around when it came time to take cuttings. Unless atypical cutting material is avoided by marking or removal, or sports are later rogued out before sale or distribution, a lot of incorrectly named plants can be generated in fifty years.

In closing, I see no basis for questioning 'Conquest'. I found no evidence of a mistake in the documentation that would lead me to question the official description, and there is insufficient information for us to make a judgment about whether the parents were carriers of the white gene. Someone would have to do the cross again and grow all those resulting plants to flowering size.

REFERENCES AND NOTES

(1) Jane Newman has grown Glenn Dale hybrids for many years. The reader is referred to her articles published in **THE AZALEAN**, Vol. 14, No. 1 (1992) and Vol. 20, No. 1 (1998) entitled "Trying To Identify Those Glenn Dales" and "More On Trying To Identify Those Glenn Dales" respectively.

(2) Miller III, W. C. and West, R. T. *The Bell Book: A Companion to Monograph 20*. The Azalea Works, Bethesda, MD 1994. *The Bell Book* contains theretofore unpublished information about the Glenn Dale hybridizing program and a set of four tables which permit the identification and comparison of the Glenn Dale hybrids by

Bell Number, Plant Introduction Number, Plant Name, and Seed Group. The last table permits the identification of sister-seedlings.

(3) West, R. T. and Miller III, W. C. *The Glenn Dale Azaleas Revised*. The Azalea Works, Bethesda, MD 1996.

(4) "Monograph 20" is another name for Morrison's account of the development of the Glenn Dale hybrids. Although commonly used, the proper title is *The Glenn Dale Azaleas*. It has been out of print and unavailable for many years. For the serious hobbyist and the plant professional alike, a revision by West and Miller is available from The Azalea Works in Bethesda, Maryland.

(5) See the article by Rothe and Miller entitled "The Most Unusual Striped Flower" that was published in the March 1988 issue of **THE AZALEAN**, Vol. 10, No. 1. This is B32140 from which 'Cinderella' and 'Satrap' are derived. Several specimens of B32140 were discovered in Plot 9 at the Glenn Dale Station.

(6) Galle, F. C. *AZALEAS*. Timber Press, Portland, OR 1985. All

references to Galle's book are to the first edition.

(7) The reader is referred to an article by Evans and Miller entitled "Pattern of Sporting" that appeared in the March 1985 issue of **THE AZALEAN**, Vol 7, No. 1. The prime feature of this article is an original drawing by Ben Morrison that presents his understanding of sporting in azalea flowers. This issue is of prime importance for individuals engaged in the propagation of unstable or highly variable cultivars (e.g., many Satsukis).

William C. Miller III, co-Chairman of the ASA's Membership Committee and Chair of the Public Information Committee, is a recipient of the Society's Distinguished Service Award and the Brookside Gardens Chapter's F. P. Lee Commendation. He is a former Vice President of the Society, a past President of the Brookside Gardens Chapter, a past member of the ASA Board of Directors, and a long time ASA member. He is a frequent contributor to THE AZALEAN. He was chairman of the ASA's Glenn Dale Preservation Project and is a co-sponsor of Dick West's Ten Oaks Glenn Dale Project.

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Photographs by Jane Newman

Table 1.
A Comparison of 'Conquest' to its Parents and Sister Seedlings.
'Illusion' x 'Gaiety' - Seed lot 38972

Cultivar	Bell No.*	PI No.	Bloom Time	Flower Size	Flower Color	Habit	Distributed
Mandarin	39045 (1946)	163986	M. May	2.5-2.75"	dp pink/dp yel pink	3'	1953
Conquest	39050 (1946)	163987	M. May	2.5-2.75"	white w/viv purple red	3'	1953
Bagdad	39543 (1947)	163985	E-M. May	2.5-3.0"	light purpl pink	5'	1952
Jubilee	40380 (1948)	163890	M. May	2.0-2.5"	deep pink	3'	1953
Ursula	40746 (1949)	160026	E-M. May	2.0-2.5"	vivid pink	5'	1953
Illusion Mac rantha Orange x Momozono	32243 (1939)	160018	Late April	2.5"	deep rose pink	4'	1948
Gaiety Macrantha deep Salmon x Hazel Dawson	35275 (1940)	141910	E. May	2.0-3.0"	pale rose pink	5'	1942

* Bell Number and year assigned