Gary's Garden and Beyond

Kit Kat Club - January 18, 2000

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Thanks to the hospitality of our incomparable Christopher Katt, all of us have had the opportunity to experience the Ohio Historical Village.

Slide 1 - Ohio Village

It is as we know a recreation, perhaps now a bit more idyllic and certainly cleaner, of a typical Ohio village on the outbreak of our great civil war. Because of the generosity of General and Mrs. Mason and others, there is even

Slide 2 - Garden in Ohio Village

a mid 19th century garden next to the Colonel Crawford Inn. However, that garden lacks representation of an essential and important plant - the rose. This evening I will try to provide you, verbally and visually that which is missing there physically; touching on the history and significance of the rose, what it is botanically, where it had developed by 1860, and what was to come after.

Fossil evidence dates the rose to at least 32 million years ago, in the Oligocene epoch, making it an old, but by no means primitive plant. Wild or specie roses can be found on all continents of the northern hemisphere, ranging from the arctic circle and Siberia to India and Mexico. Its importance to man is demonstrated by references to it from the very beginning of recorded history. Pictorially, it is seen on Minoan frescoes at Knossos in Crete dating from the 16th century BC. and also on frescoes on Egyptian tombs. Book 23 of Homer's *Iliad* tells of Aphrodite anointing the body of the fallen Hector with rose oil. Herodotus, the father of history, described a fragrant rose with 60 petals in 446 BC. Third century BC coins from the Greek island of Rhodes (which very name means rose in Greek) depicted roses.

For the Romans, the rose assumed greater importance. It was used in ceremonies and feasts and soon became an essential part of any respectable orgy. Nero was known to have spent 6 million sesterces (about $400,000) on roses for one banquet. Later, Heliogabalus would release showers of rose petals down on his dinner guests, once in such quantities that several were smothered. All this naturally stimulated commerce. Rose gardens were created to supply the demand and trade with Egypt, the granary of the Empire, included roses. The best authors were enlisted; Virgil and Pliny wrote descriptions and cultivation instructions.

The roses used were mostly gallicas, albas, and damasks about which more will be said. One of the latter, the Autumn Damask shown here, under favorable conditions could sometimes be forced into repeat flowering in the fall.

Slide 3 - Autumn Damask

What a boon to the banquet business! Soon Roman hydrologists (plumbing was a particular area of Roman expertise) were busy digging canals to be filled with warm water along both sides of long beds planted with these damask roses to encourage their second blooming.

In the dark ages the rose was initially suppressed by the church as a pagan symbol, but was soon co-opted as the church did with so many other pagan elements. Thus, the rosary, in use from about 1100 on, took its name from beads made from the dried seed pods, or hips, of the rose. The Crusades and Ottoman invasions stimulated two-way trade or pillage, if you will, and soon new roses such as musks and briars appeared in Europe. The beautiful yellow rose shown here, has the

Slide 4 - Austrian Briar

misfortune of having two names, both of which are inaccurate. It is called Austrian Briar, but it originated in Persia, not Austria and is also called rosa foetida, which means stinky rose which it is definitely not. In any case it is a most important rose and was to play a key role in rose development a millennium later.

Settlers in the New World brought roses from the old world while discovering species unique to America. Captain John Smith's men noted Indians cultivating wild roses along the James River. William Penn brought roses to his colony in 1699. The first rose nursery was opened on Long Island by the Prince family in 1737. They sold roses to both George Washington and his in-laws the Custises for planting at Mount Vernon and Woodlawn. By the 1840's a third generation Prince and a fellow nurseryman, Robert Buist, of Philadelphia were making frequent trips to Europe to buy the latest rose introductions. They each published manuals on roses and by 1845 Prince offered over 1,100 varieties by catalogue. Thanks to them, roses introduced in Lyon in 1850 could be found in San Francisco as soon as 1856.

The old European roses enjoyed their finest hour at Malmaison, the estate of Napoleon's Empress Josephine. There between 1802-11 she assembled the greatest collection in the world with over 300 varieties. Her stature was such that her agent John Kennedy enjoyed diplomatic immunity and could freely cross the British blockade of France to bring new roses to her.

Slide 5 - Dutch genre painting

While roses were featured in Dutch genre painting centuries before, the artist Pierre Joseph Redouté, the Audubon of plant artists painted 167 plates

Slide 6 - Redouté

immortalizing the roses of Malmaison with such botanical accuracy we can identify the majority of his rose plates today, though with different names.

Slide 7 - Redouté plate

A first edition of Redouté's plates now fetches at auction about what Audubon does. Later the Parisian grocery magnate, Jules Gravereaux collected 197 Malmaison roses in 1902 to serve as the basis for his great garden, Roserie de l'Hay just south of Paris, which thrives to this day.

Slides 8-9 - Roserie de l'Hay

As great as these gardens were, they only looked like this in June and early July. The rest of the year they would look like this,

Slide 10 - Dormant rose garden

but a revolution was on the horizon. In the late 18th century, British and French East Indies trade led to the marriage of European and Asian roses. The Chinese had cultivated roses for centuries and had a major nursery, Fa Tee, in the open port of Canton. Ships calling there often would stop on the return voyage for supplies at Ile de Bourbon (now Reunion) in the Indian Ocean. There Chinese roses from Canton such as this Parson's Pink China, also known and grown today as Old Blush,

Slide 11 - Parson's Pink China

were planted in hedgerows next to existing plantings of the autumn damask rose. Nature, in the form of cross pollination, took its course and a new rose type, called Bourbon, emerged. When brought to France in 1817 it caused a sensation. The rose had inherited the vigor, hardiness and strong scent from its damask parent. But what was revolutionary was its ability to rebloom consistently in the same growing season, thanks to its China parent, which, native to a warmer climate never goes completely dormant. Suddenly all other roses were relegated for a while to history's dustbin; the public wanted roses that repeated and the French hybridizers set out to create them. An early example of a Bourbon rose which remains popular today is Souvenir de la Malmaison from 1843.

Slide 12 - Souvenir de la Malmaison

In the next decades Bourbons were crossed with each other, and with Gallicas and Damasks to create an improved class with more vigor, longer stems for cutting and more reliable repeatability. This class, called hybrid perpetuals, exceeded all other roses in popularity by 1860.

This brings us to the time of Gary's garden. But, before examining the specific roses one could have expected to find there, we should pause to look at the rose botanically. It is fortunate that Kit Kat is a stag club because when botanists talk about classification, the talk inevitably turns to sex. Someone once defined a rosarian as one with a morbid fascination with the sex organs of vegetables. Also although I will try to keep this simple, as I realize this comes after cocktails and dinner, some higher mathematics must be used. I going to ask you all to keep two numbers in mind. These are five and seven, the key numbers for understanding rose botany.

Slide 13 - Rosaceae

Roses belong to the family Rosaceae which is a family of some 90 perennials including such useful plants as apples, ash, cherries, hawthorn, quince and raspberry. So an apple is a rose relative, cultivated not for its flower which is insignificant but for its hip, a large fleshy seed pod which we enjoy eating.

Slides 14-15 - Rose hips

Breeders have focused on improving the *hip* of the apple and the *flower* of the rose. But rose hips are both attractive in their own right and have important nutritional value, containing by weight ten times as much vitamin C as oranges. Flowers in the Rosaceae family contain in each bloom all four essential parts for reproduction: calyx (the protective sepals) corolla (the petals), stamens (the male sex organs) and pistils (the female sex organs). These are arranged in complete concentric circles as shown in this photo of the moyesii rose.

Slide 16 - R. moyesii geranium

Such flowers are perfect in that they include all that is needed for self reproduction, moreover they are regular, in that each of the four parts is consistent in size (unlike say, a snapdragon or orchid). Wouldn't it be nice to be a rose: for how many of us can describe our sex life as complete, perfect and regular?

Slide 17 - Genus Rosa

Within this family the rose comprises a specific genus: Rosa. Roses are shrubs with prickly stems, whose alternate leaves consist of a paired odd number of leaflets, with one apical or ending leaflet. I won't take time to break down the genus further, but those interested have a handout which goes into subgenera, sections and species. The genus rosa contains numerous species. How many depends on the taxonomist you consult. These creatures themselves are either lumpers or splitters. The king of the splitters, Gandoger, identified 4,266 species of rose in 1881 (I hope he at least got a PhD for this effort). Since then lumpers have prevailed, so now most botanists accept a range of 120-160 species. For a rose to be a species two conditions must apply.

Slide 18 - (R. carolinia alba)

It must have *exactly* five sepals and five petals as shown here in a picture of the native American species, rosa carolinia alba, and it *must* breed true from seed. That is, if it self-fertilizes (which is what roses do best), a specie rose grown from the resulting seed will be identical to its parent.

This has enormous implications for both nurseries and breeders. First, as a nurseryman, if you want to propagate many identical hybrid roses, you must do it vegetatively from cuttings or by budding - you cannot harvest the seed because it won't germinate true to the parent plant. Budding is labor intensive, that's why the vast proportion of roses are propagated in California and Texas where cheap agricultural labor is available. Conversely, a hybridist wishing to breed a brand new rose must prevent it from self fertilizing. Breeding is accomplished by selecting a seed parent, emasculating it (by removing the stamens before the pollen has ripened), then manually transferring ripe pollen from another variety to its pistils. If the cross takes, the hip ripens and the seeds are harvested.

To get greater variety and combine desirable qualities such as hardiness and disease resistance, crosses between different species or hybrids of different species are needed. However different species have different chromosome counts. Do you remember the number seven? Seven is the haploid number for roses. Unlike humans who have a constant number of chromosomes, rose chromosomes occur in multiples of seven: diploid roses have 14 chromosomes, triploid have 21, tetraploid have 28 and so on. Now in sexual reproduction (or meiosis) each parent gives up half its chromosomes. This works fine if you have two European roses each with 28 chromosomes - the offspring will also have 28: 14 from each parent. But if you try to cross a European rose with a China rose having 14 chromosomes, the offspring will have 21 chromosomes - 14 from the European parent and 7 from the China parent. That rose is a mule, it cannot reproduce because its chromosomes cannot be evenly divided. So how did we get the Bourbons and hybrid perpetuals? The answers are: a) we don't really know and b) with difficulty. Theories abound, the one I subscribe to allows for spontaneous mutation in which, probably the damask rose parent was a sextaploid with 42 chromosomes, mated with a China rose with 14; the progeny would have the 28 we observe in the Bourbon and Hybrid Perpetual roses. In practice the majority of crosses of European and China roses were sterile; it took much trial and error to breed fertile offspring. These slides will show examples of mutation using the Austrian Briar you are familiar with:

Slides 19, 21, 21 Austrian Copper - Color mutations

These show that a rose may mutate, in this case from the pure yellow you saw as the Austrian Briar earlier, to having a different color on one side of its petals (and this resultant rose is called Austrian Copper), or having both blooms on the same bush, or even confusedly on the same flower. Mutations can affect chromosomes as well as the genes which determine color, so while damask roses usually have 28 chromosomes, they have been known to mutate to 35 or 42.

A further genetic problem the early breeders faced was that the gene producing repeat blooming was recessive. Thus the first crosses of a once blooming rose with a repeat bloomer produced only once bloomers. A further selfing of the resulting rose or a second cross with the original repeat blooming parent was required to produce at least some reblooming roses.

Having explored the rose's history until 1860 and the botanical whys and hows, let's leave science and find what might have grown in Gary's garden. Keeping to the historic sequence, we should first find some Gallicas. This is the species from which probably all European roses evolved. As a class Gallicas are hardy, fragrant, small shrubs, with flower colors ranging from light pink to purple.

Slide 22 - Rosa Gallica Officinalis

This is Rosa Gallica Officinalis, also called the Apothecary's rose, the red rose of Lancaster, and the Rose of Provins. It has been grown from Roman times for its medicinal qualities and symbolism. Despite its official latin sounding name, it is not a species, having 10, rather than 5 petals. Gary's Ohio Village apothecary would insist on growing this rose as its petals (which uniquely retained their sweet scent when dried or powered) were mixed into medicines to hide their unpleasant aromas and tastes. These qualities made it a mainstay of the French perfume and early pharmaceutical industry.

Slide 23 - Rosa Mundi

This is Rosa Mundi, a sport (or spontaneous mutation) of rosa gallica officinalis which belongs in Gary's garden for its own unique striped beauty and its place in history. Rosamundi is medieval latin for fair Rosamund, King Henry II's mistress. Indeed this rose is planted by her tomb at Godstow Abbey which bears the inscription:

Hic jacet in tumba,
Rosa mundi, non rosa munda.
Non redolet, sed olet,
Quae redolere solet.

A nice epitaph from 1176, don't you think? Oh, a loose translation would have it:

A rose lies here, within this tomb,
More chased than chaste, methinks;
She once exhaled a sweet perfume
But now, alas, she stinks.

Slide 24 - Madame Hardy

Madame Hardy is a damask rose bred by M. Hardy, curator of the Luxembourg gardens in Paris and named for his wife in 1832. Thus it had ample time to arrive here and be part of Gary's garden. To me, simply, it is the most beautiful white rose ever created and will always enjoy a place in my garden.

Slide 25 - Maiden's Blush

This Alba rose is called in english, Maiden's Blush, dating from 1797. The French call it cuisse de nymphe emué, or aroused nymph's thighs, which explains why the English go to Paris for fun. Another famous alba is the White Rose of York. Albas are derived from the specie rose, canina, or dog rose, so-named because ingesting its roots was said to cure rabies. I think we still should be grateful for Pasteur.

Slides 26-7 - Crested Moss

Crested Moss is a variety of a centifolia rose having crested fronds on its sepals. In the bud stage these are shaped like a tricorn hat, giving it the alternate name of Chapeau de Napoleon. In these roses the mossy growth exudes a musk-like scent, totally different from the sweet scent of the petals.

Slide 28 - Harison's Yellow

So far all the roses have originated in Europe, but there is a native American Rose, Harison's Yellow that belongs here. This rose was bred in 1830 by a New York lawyer (which shows they're good for something), George Harison, on a farm in Manhattan at about the intersection of 39th Street and Ninth Avenue today. Although a once-bloomer in early spring, the clear yellow blooms are so spectacular, that it enjoyed immense popularity. Pioneers took it west, where it became the Yellow Rose of Texas. To this day you can find it growing there and along the old Oregon Trail. We've already seen examples of the Bourbon rose which also would be featured in Gary's garden.

Slide 29 - Baronne Prevost

Of course, we must have the current fashion in roses represented, so we would expect to find hybrid perpetuals. This is Baronne Prevost, introduced in 1842, a reliable repeat bloomer, still popular today.

Slide 30 - General Jacqueminot

This is the famous General Jacqueminot, General Jack, to his friends. It's more typical of the perpetuals and carries the famous deep crimson color of its China parent. Introduced in 1852, it had a long popularity both as a garden and a florist's rose and is the ancestor of many modern varieties, especially such great reds as

Slide 31 - Chrysler Imperial

Chrysler Imperial introduced in 1953

Slide 32 - Mister Lincoln

and Mister Lincoln from 1965 shown here respectively.

These several examples show what might have been found in an Ohio garden in the early 1860's. All these roses are still grown and are available commercially today. Some types such as uncrossed chinas, teas and the American created noisettes were also being grown at this time, but only in more temperate climates farther south.

In this final part, we will see what followed in rose development and complete the story of how we began with the 5 petaled specie roses and arrived at the roses you see on your tables tonight. You will have noted Gary's roses came in limited colors: white, pink, red and yellow and these were unmixed. Also the form of the bloom was open, globose, floppy or quartered.

The next development was to change the shape of the bloom more than anything else.

Slide 33 - La France

In 1867 Jean Baptiste Guillot, one of a host of great rose breeders centered in Lyon, introduced La France, a cross between a hybrid perpetual and a tea rose. Tea roses come from south China and Burma and are characterized by light scents, and graceful, urn like, high-centered blooms.

Slide 34 - Safrano

The characteristic high-centered bloom form can be seen here in Safrano from 1839 which, along with General Jack, is an ancestor of Mister Lincoln. The etymology of "tea" is still subject to dispute: some say its from the scent of the roses, which I've never found to be tea-like except for Duchesse de Brabant (the variety always to be seen in Teddy Roosevelt's buttonhole). But that rose wasn't introduced until 1857, long after this class was named. Others assert it was derived from the roses having been shipped from the orient in tea chests. My own theory

has it deriving from the Fa Tee nursery where the English traded for these roses. Knowing the English penchant for abbreviating names, they simply called roses they acquired from this source, tea roses. Although La France itself was sterile, having 21 chromosomes, breeders rose to the challenge and soon succeeded in breeding enough fertile roses to establish a new class, the hybrid tea, which supplanted the perpetuals as the most popular rose until very recently. You will note the original hybrid tea parentage is one third european and two thirds china. If you factor in the recrossing of the China rose needed to overcome the recessive repeat blooming gene, our hybrid tea is even more a China rose. Thus, while the repeat blooming ability and bloom form have been enhanced, the plant has become even more tender, requiring winter protection virtually everywhere.

Towards the end of the 19th century another great step was taken to make rose breeding more scientific. Up till then breeders planted roses they wanted to cross in close proximity and hoped for the best. The results were haphazard to say the least. I suspect most of these roses only self-pollinated, but, since they were hybrids, new roses did ensue. Record keeping was nonexistent so while the breeder might have some idea of the identity of moma, the seed parent, poppa (the pollen parent) was usually unknown. Artificial or human assisted pollination was being urged by another Lyonnais breeder, Jean Sisley. But it took an Englishman, one Henry Bennett from Wiltshire, to establish the scientific basis for rose breeding. Bennett was a typical ruddy-faced, mutton chopped, earthy English farmer and cattle breeder. He decided to take a page out of his cattle breeding book and make deliberate and specific crosses of roses which he recorded as he would his cattle breeding in a stud book. In 1879 when the world had only 4 acknowledged hybrid tea roses, Bennett introduced 10 of what he called 'pedigreed hybrids of the tea rose'. While none of the ten was a great rose by our standards and all have disappeared, several contributed to the development of the modern rose and Bennett's methods provided a new empiric basis for breeding. Subsequent breeders learned to keep breeding records to establish parentage essential for further progress. Records of crosses, both successful and failed, are so important and proprietary that the great breeders of today are largely multi-generational. Sam McGreedy IV in New Zealand, the fifth generation of Kordes in Germany, the sixth of Meilland and the fourth of Delbard in France are but suggestive examples. Ralph Moore, arguably the greatest rose breeder in the United States (especially of minis and small shrubs) is now 91, and he didn't create a notable rose until his fifties.

Next color was improved. In 1900 another Lyonnais, perhaps the greatest breeder of all, Joseph Pernet-Ducher after 17 years of failed efforts succeeded in crossing a descendant of the Austrian Briar with a hybrid tea, creating the rose he named Soleil d'Or shown here.

Slide 35 - Soleil d'Or

This was the first modern rose to have a true yellow color which it passed on to many modern roses including Peace. Here again because of genetics, as we've seen, breeding for one desirable trait can also introduce undesired qualities. Using a foetida descendant to integrate the color yellow also gave all modern roses a susceptibility to the dreaded blackspot disease with which we still contend. Subsequent breeding by Pernet-Ducher and others combined the yellow with existing colors to produce the wonderful hues we enjoy today: peach, salmon, orange and scarlet to name a few.

Slides 36-7 - Troika and Folklore

These varieites, Troika, from the Danish breeder, Niels Poulsen, and Folklore from the German breeder, Reimer Kordes typify the color and form of the modern hybrid tea rose.

Economics and demographics now dictate developments in roses. First is plant size - the hybrid perpetual which could easily become 8 feet tall by 6 feet wide might have worked in Victorian estates with ample room and gardeners but few today can afford the space. Hybrid teas were smaller plants and were followed by floribundas,

Slide 38 - Floribunda (Permanent Wave)

smaller cluster flowered shrubs as seen here. Later even smaller patio roses, small shrubs and miniatures were introduced

Slide 39 - Miniature (Pucker Up)

which, as shown, can perfectly duplicate the form of the larger roses but grow only one to two feet tall with the bloom being only 1-2 inches in diameter. The trend has steadily reflected the smaller growing areas available to an urban society. One can grow 100 minis in the space needed for 25 hybrid teas or 12 old garden roses.

The second trend is the demand on leisure time which dictates creation of low-maintenance plants. This takes several forms, one in breeding hardier roses requiring less or even no winter protection. The Canadian Department of Agriculture has crossed many rugosas with hybrid teas and the late Griff Buck of

Iowa State with whom I studied, used the species *rosa laxa* from Tibet to create roses hardy to -20 degrees Fahrenheit which can prosper even in Dakota winters..

Slides 40-1 - Meilland Test Gardens

Here we see the trial gardens of the firm Meilland-Richardier in Provence where 60,000 new crosses annually are evaluated, first under glass for a year, then in their fields for two years. The best 200 are sent to 18 test gardens on all 6 continents for two more years' evaluation, Meilland would hope to introduce 4 to 6 roses in commerce out of the original 60,000 crosses six years earlier.

Slide 42- Shrub test garden

Another way to reduce maintenance is to breed more disease resistant varieties. Meilland as seen here, tests all their new shrub roses under zero spray conditions and introduces only those which are naturally resistant. Reducing the need for chemical controls also fits our more ecological conscious culture. I've costed out growing hybrid teas against modern shrubs and found that it is half as expensive and one fifth as labor intensive to grow modern shrubs compared to hybrid teas.

Finally, esthetics shape demand. Shrub roses are now bred to be attractive as complete plants,

Slide 43 - "modern" H.T. form

not these hybrid tea broomsticks supporting cabbage-like blooms prized by exhibitors.

Slide 44 - Modern shrub roses

but rather these hardy, resistant, shapely plants designed for our future gardens. Scent is being bred back after almost a century of neglect. The English hybridist, David Austin, and others have reunited the scent, form and hardiness of the old roses with the season long blooming of the new. At least two major European breeders will only introduce scented roses henceforth.

So Gary's garden was but a way station, about halfway along the path from wild roses to the roses we grow or purchase today. But the journey is far from finished. All the roses I have illustrated came from just 9 of the 120 plus species, so we still possess a wealth of untapped genetic material. I am assured this new century will see the Queen of Flowers in even greater glory.