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THE INDIAN ROSE FEDERATION

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ROSE ETERNAL
NEW LIGHT ON THE OLD WORLD OF ROSES

TOWARDS THE CREATION
OF A PAN - ASIA CONSCIOUSNESS
OF
THE ROSE

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Front Cover: *R. gigantea* flowers in Kodaikanal, Palni Hills, South India

President's Message

Ahmed Alam Khan
President, Indian Rose Federation.
Vice President (Central Asia) WFRS.
Convener World Regional
Conference - 2014.

Let me wish all of you a Merry Christmas and a Happy New Year well in advance, accompanied by good health, peace and prosperity.

It is my pleasure and privilege to welcome you to the World Regional Conference of WFRS at Hyderabad, an event all of us look forward to.

This will not only be a Conference where technical sessions and a Rose Show will be held, but provide an opportunity for a long awaited re - union of the rose family in India. We await the gathering of rose lovers from all corners of the world, to further strengthen the bonds of friendship, love and happiness. Ladies and gentlemen will converge for promoting world peace, bond with greater affection, experience pleasure and joy, for indeed we are the family of royals, associated as we are to the rose, globally considered either as the King or Queen of Flowers.

Let us meet and enjoy these four days of festivities filled with fun and frolic, cherish each moment, share knowledge, provide expertise, exchange new ideas and concepts, learn new techniques in the field of rose culture and cultivation.

On my part I assure you that you will take home wonderful memories of a memorable event. On offer will be the culture, cuisine and traditions of Hyderabad, together with the association with rose lovers gathered for the event from my Country and the World.

I am confident that this meeting will further strengthen our relationship and enhance mutual respect for years to come.

President's Message

I am pleased to have been asked to write a foreword for the 31st The Indian Rose Federation Annual. India has one of the most diverse climates in the world and its hybridizers throughout the last 70+ years have worked tirelessly to create roses for each climate, including the once thought impossible tropical climate where roses are not fond of growing. The rose has a long and honored relationship with the Indian people and the many religions in the country. Many native species roses are found here, mostly in the northern areas and rose attar was discovered in India by either the Empress Nur Jehan or her mother Salima Sultan Begum.

In addition, Hyderabad, India, is hosting a World Federation of Rose Societies Regional Convention in November 2014. Susie and I are excited about the convention as it will be our first trip to India, a country in my top ten countries I have not visited yet.

I try and collect all of the Indian Rose Federation Annuals. I find the articles to be very informative, detailed, scientific based, and good all-around reading. I know each edition will be a good read, so I can hardly wait to get my hands on the next edition. Enjoy!

Steve Jones
WFRS President

K. CHANDRASEKHAR RAO

Chief Minister
Telangana

Hyderabad

Dt.10/2014.

MESSAGE

I am happy to note that the Indian Rose Federation and Hyderabad Rose Society are jointly organizing the Regional Convention of World Federation of Rose Societies for Central Asia at Hyderabad, from 29th November to 2nd December 2014.

I am sure that the deliberations will be of immense help to all the Rose growers in the country.

I convey my best wishes to all the participants, delegates and organizers for the success of the event.

K. Chandrashekar Rao

K. CHANDRASHEKAR RAO.

Shah Alam Khan

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MESSAGE

A rose is a symbol of beauty, symmetry and perfection in nature. Rosarians are not merely horticulturists, but aesthetes of the highest order, as well. Therefore, it is a matter of immense pride for the Indian Rose Federation, for the nation at large and for the city of Hyderabad, to play host to an event of the scale and significance of the Regional Convention of the World Federation of Rose Societies of Central Asia to be held from 29th November to 2nd December, 2014. India finds itself on the world map, as far as prestigious International Rose Conventions go, and that Hyderabad will play host to the Convention, heightens our joy, pride and prestige.

Those associated with Rose Federations the world over are doubtless aware of the importance of this grand event, but for some of us who belong to the city of Hyderabad, the happiness and pride are two-fold indeed. The Regional Convention will serve to showcase Hyderabad, a unique metropolis where heritage and modernity rub shoulders with each other in a harmonious blend of cultures. Hyderabad, a city that breathes history, has much to offer and I earnestly hope that even as the aura of fragrant roses overpowers the city, our Rosarians and distinguished guests will get a glimpse of the grandeur of the city's legacy and richness of its cultural heritage.

Customarily, Regional Conventions include Rose Shows and Technical Sessions with International Speakers, among other things. I am certain that at the Convention's Rose Show, Rosarians from all over the world will get an opportunity to see some of the finest varieties of roses, including a host of Indian varieties. Similarly, they will not only get to interact with one another, exchange notes on the passion that binds them—the domain of roses, but will also stand to gain immeasurably from the insightful talks by a galaxy of distinguished international speakers. Among them are Rosarians of long standing and profound erudition like Mr. Veeraraghavan and Mrs. Girija Veeraraghavan, among other eminent speakers.

As one of the senior most members of the fraternity of Rosarians from Central Asia, I extend my Heartiest Greetings to my fellow-organizers for their meticulous planning. I know from personal involvement that they have left no stone unturned and have bent every sinew to ensure that the Regional Convention of the World Federation of Rose Societies of Central Asia, turns out to be a spectacular success.

With Best Wishes,

Nawab Shah Alam Khan

Sustainable rose breeding /growing for tropical Asia - some possibilities

An Editorial Overview

Girija and M. S. Viraraghavan

In this write-up, we present in outline, some of the interesting possibilities in rose breeding /growing, utilizing the relatively less known heritage roses/species of this area.

The ideas are arranged country-wise.

Before taking up these details country-wise it is appropriate to refer to two very important presentations at the conference which deal with the overall situation regarding wild and heritage roses in our region.

The first, by Dr William McNamara, deals with the numerous expeditions he has undertaken to collect the rose species in Asia and cultivate them in the Quarry Hill Botanic Garden in California. We are fortunate that this first hand information on collection and ex situ conservation is being presented by the explorer who has undertaken this tremendous task.

Another presentation of equal importance, by Mr. Robert Mattock, deals with the role of the Silk Road which traverses our region in the movement and distribution of rose species as well as heritage roses in Asia and Europe. The role of enthusiasts in the conservation and creation of rose hybrids all along this route is emphasized in this path breaking write-up. We understand that the earlier emphasis on heritage roses traveling by the sea route from Asia to Europe gives only one part of the process of distribution of roses. The Silk Road has been equally, if not more significant, in this process.

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We now take up the country wise distribution with an emphasis on relatively less known heritage roses/species.

JAPAN : Like many other islands, Japan exhibits some very distinctive roses which fit into our theme. One of the most interesting is the pink and white variegated form of *R. laevigata*, called 'laevigata rosea', which is not uncommon in that country. This is a very striking rose with lovely blends of color— perhaps surpassing the well known *R.laevigata* hybrid, 'Anemone', in the same color blend. Fortunately, the rather depressing observation of Gerd Krussman in his 'Complete Book of Roses' (1974) that no work has been done with this rose should not be a deterrent, as at least one distinctive seedling has been raised from it by us (codename 'Virrosea') (see photograph)

Another interesting possibility is the Japanese form of *R.roxburghii* var. *hirtula*, (or is it a new species (?)), which has the very unusual characteristic of developing typical tree form, reaching heights of 5m. and upwards. Work with this rose may yield roses which grow like small trees, hopefully rivaling the flowering cherries, also from Japan.

Incidentally, the well known *R.roxburghii plena* as seen in Japan in the Sanapia Herb Garden of the Tatsuzaki family, appears much more floriferous with a somewhat different flower form. Use of this for breeding is another possibility.

A very beautiful variant of *R.multiflora, R.multiflora adenochaeta* is wild in Japan. Louis Lens, the great Belgian hybridiser, has already released some lovely shrub roses using this species, for e.g., his Spray series- 'White Spray', 'Pink Spray' etc. But much more is possible. We will not go into detail – the subject of roses in Japan is scheduled to be dealt with, in the conference, by the well known rose scientist, Dr. Yuki Mikanagi.

CHINA : We limit ourselves to two very interesting heritage roses which have recently reached the rest of the world, as the main subject is dealt with in our conference by

Prof. Dr. Guoliang Wang and Dr.Ueda's article. Indeed China is too vast a country to be dealt with in an outline of this type.

The first rose we would like to mention is the *R. gigantea* hybrid, 'Lijiang Road Climber'. This is a rose combining incredible beauty, in pink, with extraordinary vigour and work with it should lead to remarkable results. Unfortunately, at least under our conditions, both seed and pollen fertility seem to be below par, but the possibilities are dramatic and merit attention in rose breeding.

An extraordinary old China rose is again from Lijiang – the 'China Rose of the Temple of the Ten Thousand Flowered Camellia'. This lovely rose shows the typical color change from pink to red as the flower matures, is very fertile and vigorous and a must for warm climate rose breeding. A rose species which has recently reached the outside world is the warm climate species, *R. cymosa*, which is a shrub bearing big clusters of single flowers. It is easy to imagine a line of beautiful landscape roses for warm climates if this species could be used in rose breeding. Indeed, Dr. David Byrne of Texas A& M University has already started work on this line.

LAOS : The extensive explorations by Dr. Yoshihiro Ueda in this country are dealt with in his article published in this annual. Arising from his explorations we would like to highlight the following possibilities:

1. *R.tunquinensis* : This species occurs further south than almost all other rose species, in the Bolovens Plateau of Laos at the low altitude of 600m. Warm climate rose breeding would surely benefit from using this species.

2. 'Hume's Blush Tea Scented China', Laos form: Dr.Ueda has described a form of this well known China rose, one of the four 'Stud Chinas' he found in Laos (pictured in his article and reproduced here). The possibilities afforded by this discovery are immense as the original form of 'Hume's Blush' appears to have been lost.

THAILAND : Two very interesting heritage roses have been noticed in Thailand and both of these offer new possibilities in rose breeding.

1. One is 'Gulap Mon'. This is a very fragrant dark pink to red rose in the tradition of the rose variously called 'Maggie'/'Pacific'/'Kakinada Red'. This latter is the rose which seems to have traveled around the world and is now grown in countries as far apart as USA, Bermuda, and India. 'Gulap Mon' is fertile, unlike 'Kakinada Red', in our conditions.

2. 'Chulalongorn': This is a very vigorous red rose in the Hybrid Perpetual tradition, very fragrant, and deserves the attention of rose breeders.

In passing, mention must be made of what is called 'Cosmos Rose' in Thailand. This is a fairly compact single, with clusters of pink and white flowers, in the *R.multiflora* tradition. This is very fertile as well as repeat flowering and warrants attention.

There is also a popular miniature rose called 'Rama IV', after one of the kings of Thailand. It resembles, to some extent, the well known heritage China, 'Perla de Alacanda'. When we visited Thailand we found to our surprise that the China rose called 'Telengana Pink' in India (see below under 'India') was growing happily in a little town in the Petchaboon Hills.

We have included, in this annual, a write-up by Thailand's premier rosarian, Mr. Pojana Nagavajara, affectionately called 'The Father of Roses in Thailand'. What he describes may aptly be called the decline and fall of the modern rose in Thailand, thus underlining the need for separate lines of breeding for Asian climates.

MALAYSIA: Investigations by Mrs. Mariam Ahmad (Ghazali) reveal the existence of a group of well adapted roses widely cultivated in this very tropical country. These are the so called 'village roses' of which there are many, in colors

like magenta, white, pink and even yellow, which are illustrated in her article in this annual. These roses again are clearly of interest to warm climate rose breeders.

SINGAPORE: Mr. Tuan Ching of Singapore, who shuttles between New York and Singapore, will be giving a talk at the conference, on the heritage roses in Singapore, including some Bourbon-type roses as well as Tea/China types. Pictures of these are published along with the text of his lecture

VIETNAM: With a common border with China we would expect that there would be several heritage roses of Chinese origin in this country, apart from the local heritage rose kinds. Unfortunately we could get information only on two kinds. The first, courtesy of Ms. Nguyen Ngoc Anh, relates to a China type rose somewhat like 'Old Blush', which is apparently common in the country. Mr. Giulio Baistrocchi of Italy, who visited Sapa in Vietnam has furnished us with a series of photographs of an interesting rose, in shades of light and dark pink, quite full, and looking like a Tea rose. We publish a picture of this rose. In many ways Vietnam is an unexplored gold mine of plant species. A great opportunity awaits the enterprising rose enthusiast who takes on the challenge of what heritage roses are available in this country

MYANMAR (BURMA).Our only contact in Burma is Mr.U Soe Nyunt who sent us a photograph he took in 2008 of *R.clinophylla*, which he found in the northern part of Myanmar near the Irrawaddy River Bank. This is perhaps the first time that a picture of the Burmese version of *R.clinophylla* is being published.

Dr. Yuki Mikanagi has visited Burma and she collected a blush China Tea in Archine Gatin area, en route to Mt. Victoria. We show a photograph of this very full cup-shaped flower.

INDIA: A large number of heritage roses exist in India, a few discovered, and many awaiting discovery. Two of the most interesting of these 'found roses' are the China rose

'Telengana Pink', widely grown, and which extends to Thailand as mentioned earlier. This rose has defied identification even by the well known rose authority Mr. Fred Boutin of California, USA. As 'Telengana Pink' is very well adapted indeed to warm climates it merits the serious attention of rose breeders. The other widespread heritage rose is the Bourbon, 'Kakinada Red', already referred to. This again is very well adapted to the south peninsular region of India and thrives even in the southern part of the eastern coast (Coromandel Coast), which is a very difficult place indeed to grow roses.

Among the several heritage roses available are four 'found roses' with the study names of 'Renu's Apricot Tea', 'Rajakkad China', 'Madurai Tea' and 'Holiday Home Climber'. The first is from our friend Renu's garden in the Western Ghat area (Cardamom Hills) of Kerala State, 1100 m. altitude, and Rajakkad China is from the Palni Hills, an eastern offshoot of the Western Ghats, found in the garden of Rajakkad Resort, at about the same altitude. 'Madurai Tea' was located in the 'plants for sale' in a nursery in Madurai town (Tamil Nadu). Any rose has to be very heat resistant indeed to withstand the incredibly hot climate of this town. The 'Holiday Home Climber' is a very vigorous climber with large single flowers in pink and white. It is remontant. The foliage has China rose characteristics and is growing well in Mrs. Helga Brichet's garden. We have published pictures of these four roses. But to reiterate what we said earlier, there is little doubt that there are quite a number of heritage roses waiting to be discovered in various parts of India.

Mrs. Helga Brichet in her lecture on Italian Rose Explorers in Asia will mention about the heritage roses discovered by Mr. Vicky Ducrot.

Some famous heritage roses are fairly common, for e.g., the very old Tea rose, 'Madame Falcot', which was apparently lost in the country of its origin, France, and which we could

find and send to the well-known connossieurs of Tea roses, Becky and John Hook of Roseraie du Desert, France.

PAKISTAN: Dr Mahmooda Hashmi will deal with the old roses and species in Pakistan in her lecture at the conference, so we will confine ourselves to mentioning just a few. The first is that remarkable rose, the red form of *R.foetida persiana*, found by Vicky Ducrot in the Hindu Kush Mountains. Perhaps surprisingly even *R.laevigata* and its hybrid, 'Anemone', are naturalized in Pakistan in the area around the hill-station of Murree. These are called 'Mardan White' and 'Mardan Pink', both in Pakistan and in north India.

AFGHANISTAN and IRAN: Afghanistan is the home of that brilliant yellow species, *R. ecae.* Great hybridizing potential here, as is evident from that astonishing species hybrid 'Golden Chersonese', bred by E.F.Allen, Hon. Scientific Adviser to the R.N.R.S., U.K., in the 1970's. It is in fact surprising that a shrub rose of such eye-catching beauty remains relatively obscure, but its existence is an obvious pointer of what is possible.

Like China, Iran is too vast a country with a long tradition of rose culture, in which there are surely many heritage roses waiting to be discovered. Some of the roses of Iran are described by Dr. Yoshihiro Ueda, in his article reproduced in this annual. But we cannot resist speculating why that other golden rose of Iran and other regions of central Asia, *R.hemispherica*, has never been used in rose breeding. There is a tantalizing tale of a mystery golden rose, a very large shrub, thriving in the shade of the Great Mosque in Kashgar, a town at the extreme western boundary of China, as it stretches into central Asia. This must surely be *R.hemispherica*, but how does it grow in shade??

ISLANDS IN THE INDIAN OCEAN: Maldives, Mauritius and Reunion lie in the paths of ships coming from China and further east, bound for Europe, particularly in the 19th century. Roses very difficult to find in Europe, like for

e.g., 'Slater's Crimson China', are naturalized in Mauritius, as described by Gwen Fagan, the well known rosarian from S.Africa. An extract from her book 'Roses in the Cape of Good Hope' forms part of this annual.

We should also mention that the first Bourbon rose, 'R.Edward' (Edouard) seems to have originated in Reunion (earlier called Ile de Bourbon). But there are alternative theories on the origin of this pioneer hybrid in the intriguingly titled presentation by Mr. Behcet Ciragan, " Traders, Tulips and Roses'.

MIDDLE EAST : Information on heritage roses in the Middle East has been impossible to find though there can be little doubt that many roses of these kinds exist. All that we could secure is a wonderful article on Sufi poetry about roses from that region by Prof. Kawther Mahdi Al-Zwelef of the University of Jordan. Perhaps Mr. Ciragan will throw more light on this region

We have not dealt with the roses of the northern part of Central Asia as the climate is quite different from the tropical parts of Asia that we have dealt with so far. But we should mention that there are many roses of extraordinary beauty in the area.

In conclusion we would like to emphasise that considering the vast extent of Asia much more remains to be discovered but we felt that at least an outline to begin the process of search for the heritage roses of Asia is very much warranted.

VIRROSEA -laevigata rosea hybrid

China type rose -Vietnam

Gulap Mon -Thailand

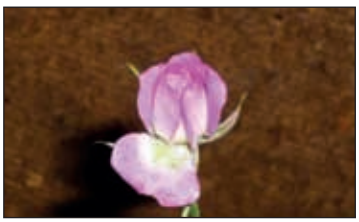
Tea rose - Sapa, Vietnam

Chulalongorn -Thailand

R. Clinophylla in Burma

Cosmos Rose -Thailand

Telengana Pink



Rama IV - Thailand

Kakinada Red

Renu ApricotTea

Rose Edward

Rajakkad China

Burma Archine Gatin China

Madurai Tea

Kerala Tea

Holiday Home climber

Pondicherry Bourbon

Qing Yan Blush China

Glimpses of the Rose Journey - in myth, legend and poetry

Prof. Kawther Mahdi Al-Zwelef

1. Introduction:

The first written record of the rose dates back some 3,000 years to Sumerian and Babylonian records discovered in Mesopotamia; or what is now known as Iraq. The Babylonians decorated 'The Hanging Gardens' with roses; turning these gardens into one of the seven wonders of the ancient world.

The first painting of the rose was found in Crete and dates back to 1500-1600 BC. The colour of roses, the season of bloom, their number and habitat, and the inspirational story behind each rose might assume a multiplicity of meanings, implications and signs.

The rose is loaded with layers of rich symbolism. It could be an emblem of beauty, spring, earthly or divine love and even confidentiality. In some traditions and at certain periods, each rose used to carry a special implication; and a full dictionary of rose language can show us what each signifies or says. Paradoxically, the withering rose, or flower, may represent the swift fleet of youth and time, the transient nature of life, and sometimes even decay and death.

2. Rose Myths and Legends:

The rose had found its unique place and reverence in old Iraqi mythology; specifically in the Epic of *Gilgamesh*, tablet 11, ll. 268-271. The wondrous plant that Utanabishtim reveals to Gilgamesh is described as a flower that has thorns; just like those of a rose, and that this legendary flower can make human beings immortal.

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The mythical significance of the rose to the ancient Egyptians is undeniable. In Egyptian myths, roses were sacrificed to the goddess Isis. The Royal Egyptian tombs were decorated with images of roses, and well preserved rose buds were found buried beside the mummies of ancient Egypt as a sign of the roses' spiritual value. It is said that Cleopatra used to cover her bed daily with fresh roses. The rose became a symbol for the Old Egyptian king Horus; later known as the 'god of silence'.

Arabic mythology has its incredibly romantic story about the creation of the red rose. It suggests that all roses were white at first, but one day a nightingale fell deeply in love with a white rose; that its beauty provoked the coveting common song of the impulsive nightingale; turning it into a sweet melodious one. But when he cuddled the rose, its thorns stabbed his heart and his blood turned its colour red.

Although the rose is seldom mentioned in The Holy Quran, yet it still functions as a sacred symbol in Islam. The famous 'Oily Rose' as referred to in The Quran chapter (55): Surat ar-Rahman, could be the most arresting reference to the rose. Surat ar-Rahman states: *"37. When the sky splits and becomes like a tanned red rose. 38. Then which of the favours of your Lord you deny?"*. These lines discuss a phenomena expected to take place during the final hour of the lifecycle of our universe; when suddenly the sky will explode and melt away, forming an oily red rose nebula; a description that "bears close similarity to red celestial bodies with a plicate appearance, especially the 'Rosette Nebula'.

The Red Rose is not only regarded as a blessed and noble flower by Muslims, but "the light of every plant"; for its connection with Prophet Mohammed ; who loved roses and used them and their oil in his daily spiritual practices.

3. The Rose in Mystic Traditions:

All mystic writings are marked by profound spiritual feelings, and the rose operates impressively in most of these

traditions to evoke a variety of connotations that convey these sentiments literally or symbolically. Almost all systems that have spiritual inclinations have ascribed some mystic qualities to the rose because they perceived it as a perfect symbol of beauty and integrity. In the Sufi wisdom, the rose could be:

"A symbol of the soul. Like the development of our own souls in this world, roses bloom amidst thorns. The rose fragrance is the ethereal connection with our higher selves. Many Sufis of the Rose Crescent tradition choose to anoint themselves with rose oil prior to performing their daily prayer, dabbing a bit of oil behind the ear, on the back of the hands and in the middle of the forehead".

The spiritual quest of the Sufi soul for the union with God indicates an escape in the name of divine love, to maintain the desired union with the Beloved: God. The famous 13th century Sufi poet Jalaluddin Rumi writes the following memorable lines:

Like the rose I am laughing with all my body,
Not only with my mouth,
Because I am without myself,
Alone with the king of the world. (Poem 11, ll. 1-4)

Blooming roses and flowers echo with the tenderly stimulated heart, and naturally symbolize 'enlightenment'; or the unfolding of awareness and the opening of the heart. When God takes residence within the human heart, the illuminated mind opens, and the soul reaches ecstasy; which makes the heart blossom like a rose. The 11th century Sufi poet Hakim Sanai expresses such an elevating radiant feeling in "Bloom Like a Rose":

Your heartrending fire
Made me bloom like a rose.
I died at Your feet
And returned fast to life. (ll. 3-6)

The 700-year-old Sufi classic poem 'The Secret Rose Garden' by Shabistari, remains with us today, vital and beautiful, the garden was planted with roses of Love and Adoration, of Reason and of Spiritual Illumination, of Knowledge and of Faith. In the center is a rose-tree of unequalled splendor, the tree the author planted with all his heart's adoration—the description of the perfect face of the Beloved.

The Sufi reference to the 'Rose Garden', thus, could involve the awareness of God's presence within one's heart; that turns this heart into a spiritual garden. Rumi sings *"And you—if you have no foot, choose to journey into yourself"* (poem 146), and the 15th century mystic poet Kabir writes these inspiring lines :

Do not go to the garden of flowers!
O friend! Go not there;
In your body is the garden of flowers. (ll. 1-4)

The Sufi 'garden' has become synonymous to a mystic inner refuge; while its flowers are the spiritual qualities that have bloomed within the heart enabling it to open to God's love. The following are Jalaluddin Rumi's enlightening lines on the attributes of this garden:

Bird of heart, fly amidst the garden of its beauty,

.....

There is a gift in the midst of your body's loans;
Search in the middle of the soul for the gift of Giver.

.....

Since you quitted the clay, you forthright entered the garden
Of the heart; so from that side is there naught but concert

.....

Since you left the salt marsh of the body for the garden of the soul,
Is there naught but rose and basil, tulip and fountains of water?

(Poem 279, ll. 11-20)

This is the mystic experience of opening the heart to embrace the Divine Beloved. It is a garden where the tranquil soul contemplates and feels the active presence of God. In this sense, the Sufi garden could be identical to Heavenly 'Paradise'.

In other contexts the Sufis couple the rose with the nightingale in a spiritual love relationship; where the Rose is the Beloved/God, and the nightingale is the Sufi/ soul lost in its love of the Rose. Sadi writes in his book *Gulistan* [or *The Rose Garden]* (1823, chapter 11, 97):

All things thou seest still declare His praise;
The attentive heart can hear their secret lays.
Hymns to the rose the nightingale His name;
Each thorn's a tongue His marvels to proclaim. (ll. 1-4)

In such a case, the garden would represent the soul contemplating in the attendance of the Divine.

One of the most important Sufi treatises was *Alchemy of Happiness*, written by Al Ghazali (1058 A.D). What concerns us here is not the issue of compatibility of Islamic law and Sufi doctrine discussed in this book; but the fundamental symbol of the Rose employed in the Sufi *Alchemy*, and its influence on Europe. Under this Sufi influence, the European 'Alchemist Guild' appeared, and chose the Sufi rose as its symbol; believing *"the gardens of philosophy are planted with many roses"* and affirming:

"This popular flower has a complicated symbology with paradoxical meanings. It is at once a symbol of both purity and passion; both heavenly perfection and earthly desire; both virginity and fertility; both death and life". In addition, this Sufi rose ensured for European alchemists and hermetic organizations, the original symbolic implication of secrecy:

"Because of its association with the workings of the heart, the rose in alchemy has come to symbolize secrets of the heart,of things that cannot be spoken, or an oath of silence in general."

In the folded structure of the rose, the flower seems to be concealing a secret inner core.

"Mystery glows in the rose bed and the secret is hidden in the rose", wrote the twelfth-century Persian alchemist Faridu ud-din Attar.

It is possible that 'silence' was also utilized by the Sufis when we take into consideration the fact that mystic love is something to be kept secretive lest the profane should ridicule, as in Rumi's line*: "Close the door of speech and open the heart's window"*(poem 233).

The Sufi Rose symbol is approached sometimes in an extraordinary manner, and given far-fetched interpretations. Idries Shah, for instance, "states that the Arabic word *wird* (meaning dervish exercise, i.e., the Work) was used poetically as 'Ward' (rose)".

Buddhism is said to include many references to the rose as well. Both Sufism and Buddhism use the same symbol of the 'unfolding flower' as an emblem. Although the 'Lotus' is the Buddhist flower and not particularly the rose, yet these two great wisdom traditions share the same mystical perception of equating the human heart with the flower. Just as the flower blossoms and leads a fragrant life, the mystic heart blooms and takes nourishment from its spiritual quest for enlightenment.

To manifest the significance of the rose, the Buddhist teacher Osho introduced the "Symbol of the Mystic Rose" and the "Mystic Rose Meditative Therapy", instructing his followers "*unless your rose opens within your own being, you are just a commodity*". He even reported a story of how Buddha came one morning carrying a rose to his daily sermon, and gave it to his disciple Mahakashyap; who became later the founder of the Zen tradition. Buddha's justification of giving this rose to Mahakashyap was: *"what I cannot give in words I am transferring to Mahakashyap"*. In doing so, Buddha was declaring his choice of this disciple as his successor, and was

transferring to him, symbolically through the rose, his innermost spiritual experience and his responsibilities. This procedure is called in Buddhism *"the transmission of the light, the opening of the mystic rose"*.

Another ancient Hindu story relates that the protector of the world, the god Vishnu regarded the 'rose' as the most beautiful flower in the world, while the creator of the world, the god Brahma, backed the lotus as the most beautiful. Upon seeing the rose for the first time, Brahma immediately acknowledged its supremacy, and rewarded Vishnu by creating him a bride, called Lakshmi, from 108 large and 1,008 small rose petals.

Another Buddhist fundamental perspective is the belief in the transitory nature of life. And here the rose can again serve the purpose perfectly. For Buddhists, man is born as a seed that has incredible potential for development; yet, he will fade and wither just like a rose, unless he accomplishes his supreme fulfillment and flourishes into a mystic rose. In attaining this state of full awareness, the heart will flower and open all its petals, and the human being will be part of the perpetual soul.

Even the form of the rose, in Buddhism and Hinduism, has the primary function of suggesting 'the cup of life or the center of Mandala, a configuration of geometric shapes, which symbolize a meditational path to Nirvana'.

4. The Rose in Literature:

Literature from the East to the West and from Ancient times to the Modern Age is infused with the scent of roses, although no one knows exactly what fabulous journey the rose has taken. Whether indulged for its beauty, gentleness, sweet aroma, universality and artistic merits, or for the rich emblematic connotations it enfolds, writers kept finding it worthy of their adoration and each viewed it from a different angle.

The rose has been an old soul that has found its way to Sumerian and Babylonian cultures thousands years ago. The Babylonian author Huna (C.216-297 AD) wrote "A rose, bent by the wind and pricked by the thorns, yet has its heart turned upwards". Some poets identified the rose with the short human lifespan. The poet Sadi wrote *"Those roses but five days or six will bloom; / This garden ne'er will yield to winter's gloom"* (*Gulistan*, Preface 14).

Alchemy guild also chose the rose as its emblem through which the guild transmits messages to its members and announces the issues that will be raised in the meetings, through the colour, position and degree of bloom of the roses presented at each of their meetings.

The Sufi thinker Abdul Qadir Al-Gilani "is known as 'the Rose of Baghdad' and his order, the Qadiriyya, uses the rose as its symbol."

The Sufis allegorically, equate the human soul sometimes with a nightingale that chooses to journey towards the beautiful rose in an attempt to attain inner perfection. Since the rose is a symbol of the beauty, glory and perfection of the Beloved, according to the Sufi dictionary, then the nightingale's unfulfilled longing and consuming devotion for reaching out to the rose, would represent the passion for union with eternal beauty; or the Absolute. The impassioned symbolic divine love song of the nightingale and the rose, alludes to the basic truth that the nightingale/spirit desires to take a pilgrimage back to its original pure sphere of the rose/ the Eternal ; turning love thus into a worship.

Wild Roses in Asia And The Quarryhill Botanical Garden

Dr. William A. McNamara

For the last 25 years, as Assistant Director and later Executive Director of Quarryhill Botanical Garden in Glen Ellen, California, I have been collecting small amounts of seed and voucher specimens from naturally occurring plants in warm temperate regions of Asia. Most of this fieldwork has taken place within the Sino-Himalayan and Sino-Japanese floral regions, two of the world's great floras, primarily China, Japan and the foothills of the Himalayas in India and Nepal. Although our original focus was quite broad as we were building a botanical garden, our current focus is limited to a small number of specific genera including species roses. One of our primary goals has been to preserve wild germ plasm and to make that available to researchers and other scientific establishments as we try to better understand and conserve the wonderful world of plants. With regard to rose species, a principal goal has been to advance the knowledge of the unique and important influence that roses, specifically species, but also hybrids, from China and other areas of Asia, have had on the development of the modern rose.

Many people, and especially gardeners, consider the rose to be the quintessential garden flower. Everyone knows and loves roses. It is impossible not to, with their showy flowers and delightful fragrance. Almost all gardens have roses as one of their prominent features. What few people know though, is the significant influence that Chinese and other roses from Asia have had on the development of modern roses. Of the two hundred or so roses that occur naturally around the world, half of those are found in China. China is

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the center of origin and center of diversity of roses. A little more than two hundred years ago, several roses made their way to the west from China. Of these, four in particular became major influences in the breeding of new hybrid roses. These in turn were crossed and re-crossed over the last two centuries resulting in the wealth of roses we all so much enjoy today. At Quarryhill Botanical Garden we are growing as many Asian rose species as possible and have recently created a new rose garden not just to display the beauty of roses, but more importantly to tell that story.

The Legacy of the China Rose

China roses arrived in Europe in the late 18th and early 19th centuries from southern Yunnan, China and other parts of Southeast Asia, to forever change the course of rose breeding and culture in the western world. The particular traits that enthralled the rose world were repeat blooming, or remontancy, which was as yet rarely known outside the East, and the stunning beauty of scarlet to crimson colored flowers. The four "Stud Chinas", three of which are extant and represented in the center of the new rose garden at Quarryhill, and other Asian introductions combined their genes with those of long-standing European varieties to produce myriad rose classes, now ubiquitous and dominant in rose culture the world over.

Rosa chinensis var. *spontanea* and *Rosa odorata* var. *gigantea*, both thriving at Quarryhill, are the two native Chinese species widely believed to have contributed most to the China and Tea roses, two groups that have maintained their separate identities despite extensive hybridization. Descendants of China roses include the Noisettes (China x Musk Rose) and Tea-Noisettes, Bourbons (China x Autumn Damask), Teas (Tea-Scented China x Bourbon/Noisette), Hybrid Chinas (China/Noisette/Bourbon x Once-blooming European varieties), Hybrid Perpetuals (Hybrid China x Portland/Noisette/Bourbon), Hybrid Teas (Hybrid Perpetual x Tea), Polyanthas (China/Tea x *Rosa multiflora*/*Rosa wichurana*), and

Floribundas (Polyantha x Hybrid Tea). Clearly, these relatively few Chinese introductions from two hundred years ago have had a profound and lasting influence on horticulture and the seemingly endless appetite for roses of every size, scent and shape.

The Tea Rose Legacy

European Tea Roses originated from cultivated varieties that evolved over many centuries in Southeast Asian gardens, loosely named *Rosa odorata* and most likely parented by the Wild Tea Rose, *R. odorata* var. *gigantea*. Two of the four stud roses, Hume's Tea-Scented China (cream to pink colored, named 'Spice' in this garden) and Park's Yellow Tea-Scented China (now lost), introduced treasured Tea Rose traits to the western world: fruity or peppery scents resembling crushed tea leaves, large shiny petals and glossy green foliage, repeat blooming, and new floral shades of ivory, cream, yellow, pink, copper and apricot.

Hume's was combined with Bourbons and Noisettes to produce the first pink Teas while Park's crossed with Noisettes created the first yellow Teas. Old Teas from the 1800's, now rare, were absorbed through successive hybridizing with once-blooming Hybrid Chinas, their descendent, moderately repeat-blooming Hybrid Perpetuals, and many others, giving rise to ever more popular rose classes. These breeding efforts mainly strove to combine traits of the Old (European) roses - including distinctively scented and uniquely colored flowers, often thickly packed with petals - with those of the Chinas and Teas, resulting in the following descendants: Polyanthas, some of which combined Teas with the clustering species *R. multiflora* and, to a lesser extent, *R. wichurana*, producing dwarf shrubs with bouquet-like clusters of small flowers; Hybrid Teas, the largest, most recognized and successful of all rose classes in history; Floribundas, in all respects larger-scale but similar to Polyanthas, derived from crossing the latter with the Hybrid Teas. The Tea Rose lineage has certainly produced abundant floral riches.

Noisettes, Tea-Noisettes & Bourbons

In 1802, wealthy rice farmer and skilled gardener, John Champneys of Charleston, South Carolina, made rose breeding history when he created 'Champneys' Pink Cluster' by crossing the stud China Rose 'Parsons' Pink China' (called 'Old Blush' in this garden) with the European *Rosa moschata* (Musk Rose). This hybrid combined the shrubby habit and large, open, aromatic clusters of the Musk with the semi-double, blush/pink color and continuous blooms of the China. From this one cross and its equally well-known offspring, 'Blush Noisette', the Noisette brothers of France, working both in Europe and the US, developed their namesake and seminal class of roses. Further hybridizing with Tea Roses produced the Tea-Noisettes, with climbing habits and smaller clusters of larger, tea-scented flowers.

The Bourbon Roses originated on Isle de Bourbon in the Indian Ocean, from the garden of Edouard Perichon where the original 'Rose Edouard' was discovered in 1817, a fortuitous hybrid of the Autumn Damask and 'Parsons' Pink China'. Seeds and cuttings were sent by the Parisian botanist Bréon to the gardener of King Louis Philippe of France, where most Bourbons were later produced and popularized between 1820 and 1870. The mysterious Autumn Damask, at that time unique in blooming past spring into summer and even autumn, presents another ancient rose story that melds with that of the China roses. The result combined the damask's classic scent (found in rose oil, or attar) with the rose-colored and more continuous blooms of the Chinas, in plants displaying waxy, grey-toned foliage and stout, prickly stems.

In Search of Wild Roses in Asia

In the September of 1988, while on an expedition to Sichuan, China in partnership with the Royal Botanic Gardens, Kew, and the Howick Arboretum, we discovered a wild stand of *Rosa chinensis* var. *spontanea* south of the town of Pingwu at 740 meters (2,427 feet) elevation. The roses were

scrambling to 3 meters near the Fu Jiang (River) on a south facing hillside. At the time of the collection, we did not know which species it was. When it flowered three years later, it was confirmed by botanists at Kew Gardens that it was in fact *Rosa chinensis* var. *spontanea*. This was quite exciting for us as this species had only been rediscovered by Japanese plantsman and explorer extraordinaire Mikinori Ogisu in 1983 in southern Sichuan near Leibo. Until Ogisu's discovery, it had been thought by many that *Rosa chinensis* var. *spontanea* was possibly extinct in the wild. It was seen by Ernest Henry Wilson in 1910 in north central and northwestern Sichuan and before that by Augustine Henry in western Hupeh near Yichang. Roses grown from our collected seeds have thrived at Quarryhill and have been widely distributed. They are quite easy to propagate vegetatively. We have four distinct forms, one almost pure white with a hint of pink, one pink, one white to light pink with scarlet stripping in the petals, and one scarlet. They begin flowering here in Northern California in early March and continue for several weeks.

Once we had *Rosa chinensis* var. *spontanea* well represented at Quarryhill, we turned our attention to finding *Rosa odorata* var. *gigantea*, the other likely wild rose that was a key influence on modern roses. Fortunately in 2002 we received seeds of *Rosa odorata* var. *gigantea* from Viru and Girija Viraraghavan from a cultivated plant in their garden. Their plant was grown from seed that they collected in 1990 at 2130 meters(6,988 feet) on Mt. Sirohi in Manipur State in Northeastern India. It was growing in an open scrub jungle with scattered tall deciduous trees and was climbing 10 meters (32 feet) into trees in full sun. Plants from these seeds are now flourishing at Quarryhill and are producing vigorous sprawling mounds. The flower buds are yellow and open to a very large light yellow or white flower.

With assistance from my good friend Dr. Wang Guoliang we collected seeds of *Rosa odorata* var. *gigantea* in the Stone Forest near Kunming, Yunnan in October of 2012. We saw

only one plant with fruit littering the ground. It was a vigorous climber to more than 10 meters (32 feet) arching up the limestone formations. The seeds germinated readily and we have planted them out at Quarryhill, but the plants have not yet flowered.

Now that we had the Indian and the Chinese form of this important rose growing well at Quarryhill, we decided to look for the Burmese form, rumored to have the largest flowers of them all. We knew that it had been collected in the Shan Hills of eastern Myanmar in 1888 by Sir Henry Collett, but suspected that it had not been collected since. From Collett's notes, we also knew that it had been found between the 19th and the 22nd parallels (of the northern hemisphere) at 4,000 to 5,000 feet (1,219 m. to 1,524 m.) elevation. He noted that it was "apparently spread over the whole Shan Hills" but was "locally abundant, chiefly in dark shady valleys." Evidently Collett spotted the roses from quite a distance due to the very large white flowers and the fact that the roses were climbing up large trees. He also wrote that plants grown from the seed he collected were growing at Kew Gardens. I checked with my old friend Tony Kirkham, Head of the Arboretum at Kew Gardens, to see if any roses remained of Collett's introduction. With the passing of more than 125 years I doubted that anything would be found and that turned out to be the case.

With funding from the Franklinia Foundation, I traveled to Myanmar (Burma) in April of 2014 to search for *Rosa odorata* var. *gigantea*. Before looking for the rose we had spent several days in the mountains of northern Myanmar near the Indian and Chinese border searching for hardy temperate plants for a future collecting expedition. Satisfied that we should return in the near future for seed collecting, we headed south to begin our search for the rose. We met up with our driver Yan Gyi Aung at Mt. Popa in central Myanmar and began the long drive to the base of the Shan Hills. My wife Joanna and I were tired and covered in horribly itching welts from nasty sand fly bites in the northern mountains. The next day the three of

us began wandering the Shan Hills staying as near as possible between the 19th and the 22nd parallels and above 4,000 feet (1,219 m.) elevation. It was very hot and we had allowed only three days for the search. For two long full days we did not see a single rose, only fire-scarred denuded arid landscapes, mountainsides stripped of most of their trees presumably for firewood, and large areas cleared for agricultural expansion. After two disappointing days, while we were commiserating with our driver at our hotel before dinner, we asked the hotel manager about the rose. I showed him a photo of the Indian form in flower at Quarryhill describing how it climbed large trees and he enthusiastically told us that when he was a young boy they saw a rose like that everywhere in the mountains. He went on to say that no one sees it anymore, but that it might be near a village called Kakku. Kakku was within our search parameters, so we went to sleep hopeful that the next day we would be successful. It was a long drive to Kakku and the landscape remained the same as the two previous days. Around mid-day and on the verge of giving up all hope of finding *Rosa odorata* var. *gigantea* in Myanmar, I suggested that we try one last search on a small mountain that we had seen on our first day, but had not yet explored. We could see a few temples on the mountain and I knew that sometimes that could mean that some of the natural flora might remain. As we wound our way up the mountain getting fairly near the summit I spotted large upright stems, some 10 cm. (4 inches) in diameter, and covered in prickles. I yelled, "stop, we've found it!" Jumping out of the car we quickly spotted some flowers. I was initially concerned that even if we found the rose, we were going to be too late to see flowers. We found only 5 flowers, each just over 8cm (3.15 inches) across with a slight fragrance. We assumed that they were small being the last of the season. We saw several fruits developing along with vigorous amber red new growth. The leaves averaged 15 cm. (6 inches) in length and had seven to nine serrated leaflets with the terminal leaflet being the largest. It was a healthy plant arching to 4.5 meters (15 feet) and just over 9

meters (30 feet) wide-growing at 1,645 meters (5,396 feet) above sea level. It was difficult to contain our excitement and we quickly began searching for other specimens. We were told that the mountain's name was Shwe Phone Pwint meaning, Gold Mystique Blooming (or Flowering) Mountain, presumably due to the early spring profusion of large flowers with their bright golden-yellow stamens. This was also the name of the Pagoda on the summit. As we climbed higher we found several more roses, though only one with a single flower. In total we found 13 specimens in a short afternoon, but surely there were more. Some were climbing over 10 meters (over 30 feet) in tall trees. The dominate plants that they were growing with were *Melastoma*, *Quercus*, *Hedychium*, *Ficus*, *Pinus*, *Shima*, *Albizzia*, and bamboo. We GPS tagged all that we found knowing that we would return in the fall to collect ripe seeds. Exhausted, but happy that on our final day in the Shan Hills of Myanmar we had finally found the Burmese wild form of *Rosa odorata* var. *gigantea*, we boarded a plane for Yangon to prepare for our return home.

A few weeks after our return home to California, I traveled to London. While there I visited the herbarium at the Royal Botanic Gardens, Kew with Dr. Peter Raven and searched for Collett's specimen from 1888. It was nearly as difficult to find as the living plant in Myanmar. We were led to different floors in vain and finally found the correct cabinet in the basement. As we opened the folders, before us lay Collett's specimen, the type specimen of *Rosa odorata* var. *gigantea*, called *Rosa gigantea* by Collett. And the flower was indeed 14 cm (5.5 inches across). Almost speechless, I felt a calm sense of partial completion and imagined Collett all those years ago wandering the Shan Hills of Burma. He too must have been speechless when he first saw the rose. The only thing to do now was to prepare for a seed collecting expedition in the fall.

The species roses that we have collected and that are now growing at Quarryhill are:

Rosa banksiae var. *normalis*
Rosa brunonii
Rosa chinensis var. *spontanea*
Rosa clinophylla
Rosa davurica
Rosa fujisanensis
Rosa glomerata
Rosa graciliflora
Rosa henryi
Rosa laevigata f. *laevigata*
Rosa longicuspis var. *longicuspis*
Rosa luciae var. luciae
Rosa moyesii
Rosa multibracteata
Rosa multiflora
Rosa multiflora var. *adenochaeta*
Rosa multiflora var. *cathayensis*
Rosa odorata var. *gigantea*
Rosa roxburghii f.*normalis*
Rosa rubus
Rosa rugosa
Rosa sericea
Rosa sericea subsp. *omeiensis*
Rosa sertata
Rosa sertata var. *multijuga*
Rosa setipoda
Rosa sikangensis
Rosa soulieana
Rosa sweginzowii
Rosa transmorrisonensis
Rosa tsinglingensis
Rosa webbiana
Rosa wichurana
Rosa willmottiae

We have several other wild rose species at Quarryhill that have not yet been identified and we are continuing to add to the collection with our annual expeditions to various regions of Asia. Some rose species that we have collected have failed to germinate. All of these wild rose species are made freely available to other botanic gardens, universities and researchers with our primary goal to preserve the wild germ plasm of these important, unique and beautiful plants.

Many thanks to Howard Higson for his generous permission to use his commentary on the Heritage Rose Garden at Quarryhill Botanical Garden. Also, many thanks to my wife Joanna for enduring difficult travel to remote parts of the world over the years with me in search of plants.

'The rose hath humbly bowed to meet
With glowing lips her hallowed feet,
And lent them all its bloom'.

Kalidasa's Meghadutta,
translated by Paterson and quoted in
"Book of Perfumes" by Eugene Rimmel (1865)

Rosa chinensis var. spontanea
at Quarryhill Botanical Garden

Various forms of *Rosa chinensis* var. *spontanea* at Quarryhill BG

Rosa chinensis var. *spontanea* at Quarryhill BG

Rosa odorata var. *gigantea* form from India at Quarryhill BG

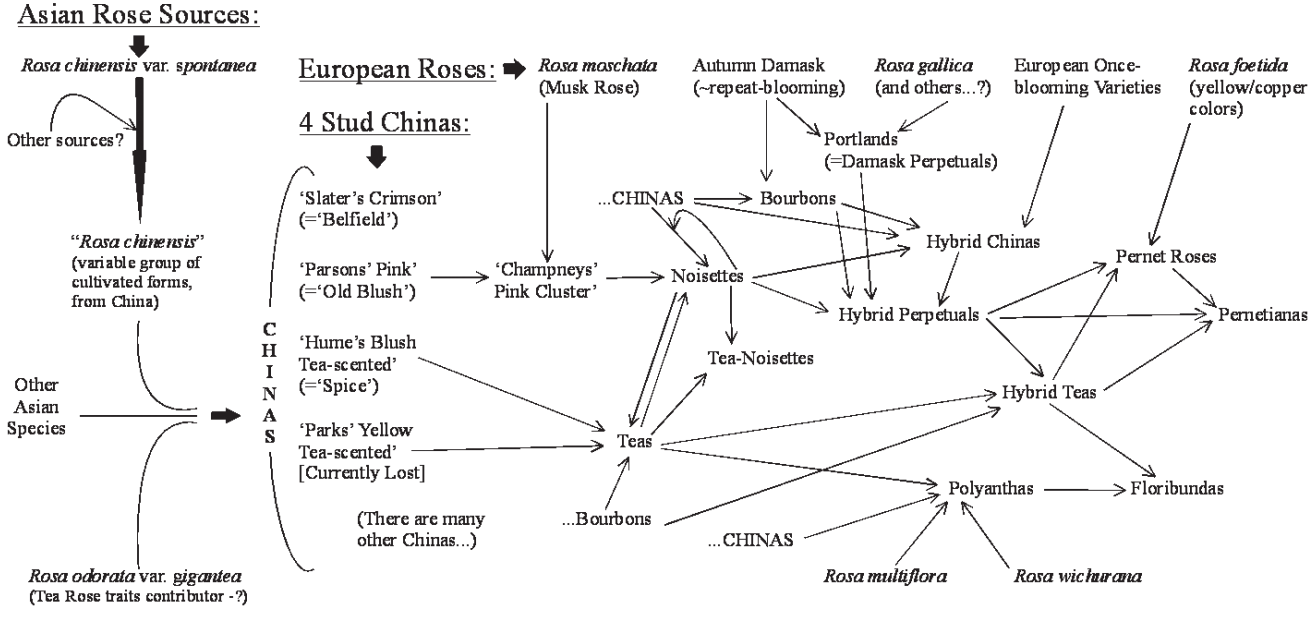
Rosa odorata var. *gigantea* on Gold Mystique Flowering Mountain

Rosa odorata var. *gigantea* on Gold Mystique Flowering Mountain

Young fruit of *Rosa odorata* var. *gigantea* on Gold Mystique Flowering Mountain

Voucher specimen of *Rosa odorata*

China Rose Lineage



Silk Road Hybrids

Robert E. Mattock

This project was designed to test the hypothesis that humans were responsible for the migration of "repeat flowering" roses along the Silk Road.

Introduction

In the West the much prized characteristic of garden roses, the ability to flower repeatedly or recurrently (remontancy), owes its occurrence to hybridisation between European roses, Central Asian roses and roses from the East.

The only wild roses carrying the remontant gene are indigenous to China, Korea and Japan. Wild roses do not trans-migrate lattitudinally because they have no reason to do so.

Hitherto the so called Stud China Roses, the *Rosa chinensis* hybrids that were transported from China by sea, and introduced in to Great Britain and France from 1792, have been extensively credited with being the source of remontancy in the breeding of European garden roses.

This thesis proposes that instead those remontant genes arrived in Europe far earlier via the Silk Road during the Classical Period of Antiquity. Furthermore "the study", that involves the narrow trade in plants, is to be portrayed in the context of a wider cultural exchange, "Cultural Linkage".

It is suggested that whilst initial links between cultures are forged by invention, by *homo faber,* it is not the inventor but rather the craftsman, *animal laborans,* whose pride in his work enables him to incentivise himself to do the best he can and as a consequence achieve respect not only in his own

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work, but by extrapolation, that of others. It is further propounded that mutual respect for each others' work or craftsmanship is a sound, practical basis for a mutual respect for each other's cultures.

There is evidence to show that roses carried along The Silk Road were hybridised, or invented, en route to create better varieties with more fragrance, stronger colours, longer flowering periods, and so on. Those inventions, those new roses would however, have come to nothing without the intervention of the craftsman, the nurseryman, who cultivated and multiplied the new rose perhaps for the benefit of gardeners; or what appears to be more likely for the production of rose water.

The research project is in three parts:

1. The identification and geographical distribution of those rose species and their hybrids that research is expected to demonstrate are the parents of the remontant varieties that occur or occurred along the Silk Road. A living, systematic and comprehensive collection is being established in Oxfordshire, U.K. to provide material for laboratory analysis.

2. An investigation into the historic dissemination of horticultural education that enabled the hybridisation, propagation and transportation of remontant rose species and hybrids backwards and forwards along the length of the Silk Road. A model that describes the master, journeyman, apprentice regime in the U.K. is being used for comparison with the historic regimes of Central and Far Eastern Asia in collaboration with Oxford University's Department of Education and the Economic and Social Research Council.

3. The establishment of the genetic linkage of the hybrids identified from the above using ISSR-based phylogenetic studies at Plant Sciences, University of Bath, which have been proven to be a simple and useful method for cultivar detection.

In summary the thesis sets out to establish where and when those cultural exchanges that enabled the hybridisation of remontant roses took place, through the analysis of cultural records and the exploitation of DNA genetic markers (Fig. 1).

Background

Some fifteen years ago the author was much taken with an oil painting by Sir Lawrence Alma Tadema of the notorious if not apocryphal September 'flower party' held by Roman Emperor Elagabulus sometime around 200 AD. Apocryphal or not, those parties described in *Suetonius Nero 31* and *Suetonius Nero 27* would have undoubtedly demanded the characteristics of remontancy from China[1] (Fig.2).

The author's interest aroused, he researched further, finding that between 30 & 38 AD, Virgil in his poem *Georgics IV*, refers to "*biferique Rosaria Paesti*" [2]i.e. the remontancy of the roses of Paestum, a small town about twenty miles south from Rome.

When in Rome ….. Sitting in the very beautiful Villa Guilia (Villa Julia)[3] the author was struck by the horticulturally accurate depictions of the several hundred roses in the frescoes painted on the ceilings of the interior colonnades. It is not at all difficult to identify a form of the gallica *Tuscany* and pertinently to this paper, forms of The Damask Rose, R. *x damascena* (Fig.3).

A literature review revealed further possible evidence derived from contemporary cuneiform tablets recording Alexander the Great's entry on 2nd. October 331BC, (note the date) through the Ishtar Gate into the City of Babylon when the Babylonians danced and threw rose petals in front of their new King's golden chariot.[4] Better defined, perhaps, by new research on the Babylonian astronomical diary which says that on, again note the date, 24th. or 25th. October "Alexander its King entered Babylon with horses and the accoutrements of war "…. "The city elders had hastily organised a welcome; the street was strewn with flowers and garlands; altars burned

incense and oil on the sidewalks and wafted pleasant smells as the citizens showered Alexander with rose petals"[5]. Historically it is said that only two roses of the ancient world bloomed in the autumn.

Rosa moschata a Musk rose, single with very few petals and the *"Autumn Damask"* very double with a profusion of petals. Given the choice, it is the latter, given its many petals that one would guess showered the great man.

Where did the remontant gene originate?

The only wild roses (rose species) displaying the characteristic of remontancy are:

Rosa chinensis (South West China)

Rosa fedtschenkoana (it is native to the foothills of the Ala Tau, Tian Shan and Pamir-Alai mountain ranges in central Asia and northwest China.)

Rosa rugosa (*Rosa rugosa* occurs naturally in Eastern Asia from Ochotsk and southern Kamchatka to Korea and the northern parts of Japan and China).

The following purely illustrative map shows the uniquely far eastern distribution of recurrent flowering wild rose species. Plants in general and roses in particular do not naturally trans-migrate lattitudinally because their polarity is aligned longitudinally, the result of their phototropic and thigmotropic responses to heat and light. Consequently the latitudinal transmigration of those far eastern roses displaying the remontant gene could only have occurred through man's intervention (Fig.4).

The Damask Rose *Rosa x damascena*

The Damasks comprise two distinct forms: The Summer Damasks and the Autumn Damasks. The former flower once only and are large, thorny quite open growing shrubs with intensely fragrant pink to white flowers. The latter, the subject of this essay, are shorter more compact shrubs with the ability

to repeat flower in autumn, their colour range include pink and red varieties.

"Ispahan" a widely grown garden variety is an example of *R.* × *damascena*. The garden hybrid *Rosa* × *centifolia* is derived in part from *R.* × *damascena*, as are the *Bourbons, Portland* and the *Hybrid Perpetuals.*

Rosa damascena is widely cultivated commercially throughout Iran (Persia). It maybe that the local Damask varieties in Iran comprise a rich gene pool for this species waiting to be explored.[6] The flowers are renowned for their strong fragrance, and are commercially harvested to make rose water and for making rose oil used in perfumery . The flower petals are also edible. Certainly as well as being cultivated in profusion by the Romans, damasks were grown in Egypt for export to Rome in winter.

Until recently the parentage of the Damasks has been under-researched because their lineage appeared so complicated. However in the year 2000 following over a century of not in-considerable, inconclusive, speculation as to the origins of the damask rose three Japanese biochemists, Messrs. Iwata H, Kato T, Ohno S. working for the Wakunaga Pharmaceutical Company, in Hiroshima published gene sequences which show that *Rosa x damascena* is actually a hybrid of (*Rosa moschata* x *Rosa gallica*) x *Rosa fedtschenkoana*[7].

They examined the relationship between Damask varieties and their putative ancestors at the molecular level. Random polymorphic DNA analysis of the Damask varieties proved that they had an identical profile, indicating they were established from a common ancestor. They identified the three Rosa species, *R. moschata, R. gallica* and *R. fedtschenkoana*, as parental species of the original hybridization that contributed to forming the four oldest Damask varieties by sequencing the internal transcribed spacer of ribosomal DNA.

Rosa moschata

The wild habitat of R. moschata has been the subject of much confusion, and it has never been found truly wild. It probably arose in the western Himalayan area, and was selected for its relative thornlessness, its excellent scent and late flowering, as well as its medicinal value as a purgative. Ivan Louette, the Belgian rosarian, has made a detailed study of this plant, and related forms in Iran.[8]

Rosa fedtschenkoana

A suckering shrub up to 2m high, with greyish leaves and slightly scented white flowers, around 5cm across, significantly it blooms from June to September. The hips are bristly, and orange-red. It is native to a range comprising central Asia, in the Ala-tau, Tien Shan and Pamir-Alai, extending into North West China.[9]

Rosa gallica

A deciduous shrub forming large patches of shrubbery, the stems are clothed with prickles and glandular bristles. The leaves are pinnate, with three to seven bluish-green leaflets. The flowers are clustered one to four together, single with five petals, fragrant, deep pink. The hips are globose to ovoid, 13 mm. in diameter, and are orange to brownish.[10] (Fig. 5).

Man's intervention. How did three geographically disparate species meet?

The following diagrammatic map illustrates the disparity in the geographical distribution between *Rosa fedtschenkoana, Rosa moschata,* and *Rosa gallica.* At the risk of being repetitive it must be emphasised that roses do not naturally trans-migrate lattitudinally because their polarity is aligned longitudinally (Fig. 5).

The question arises, how, when and where did *Rosa fedtschenkoana* from China get to breed with *Rosa moschata* x *Rosa gallica* of Europe?

Geological features, notably the Pamir and Himalayan mountain ranges and the South West China glacial refugium do not favour latitudinal hybridisation and in any event, and generally speaking, as we have seen earlier, plants do not naturally move from the east to the west because the earth's polarity determines that there is no warmer/cooler climatic incentive to do so.

Consequently the latitudinal transmigration of the remontant gene in *R. fedtschenkoana* so essential for producing the petals for the autumn arrival in Babylon of Alexander the Great, or the remontant roses of Paestum or for the flower parties thrown, perhaps by Heliogabulus, in Rome could only have occurred through man's intervention.

What was man's incentive?

Anglo-centrically, or indeed euro-centrically, we have presumed that well heeled gardening enthusiasts, gardening celebrities of the classical world sought garden novelties to show off to their horticultural peers and to breed new strains of colour, fragrance or growing habit into their indigenous stock.

The problem with this theory is twofold.

One, whilst there is strong documentary and illustrative evidence of sophisticated cultivars being grown in China during the Classical period[11] there appears to be no documentary evidence of those hybrids having been imported or even exported to Europe at that time. Extensive research into stylised patterns on Central Asian rugs; into motifs on porcelain and ceramics found in the Taklamakan Desert; into the head dresses of Hindu gods and goddesses reveal nothing of substance.

Secondly, The Silk Road had long been thought of as an ancient trade route which facilitated traffic in both directions between China and the Mediterranean Sea. The trade route extended some 6,440 km (4,000 ml) and linked China with

the Roman Empire from 2nd century B.C. to the 14th century A.D. It had been presumed that because by 200 BC merchant-traders were passing along The Silk Road from China to Rome they may well have carried remontant roses; after all we know that the Chinese were skilled at growing roses in pots by that time. How easy then for a well heeled Roman garden enthusiast to send a man directly to China to collect his rose order!

A splendid idea? Not so! Recent extensive and scholarly research published by the historian Valerie Hansen of Harvard University has effectively disposed of the long held notion of the straight and well travelled road to China, or come to that to Rome, depending on your start point. In place of large long distance commercial caravans, she found subsistence living and local barter. Instead of merchants, she found the Chinese military played the most important role in bringing silk onto the Silk Road.

Crucially she describes the waves of religious refugees fleeing north and then east from the Muslims; the Manicheans, the Zoroastrians, Judaists and the Buddhists.

One common denominator of these religions is their use of rose-water as an integral essential feature of their ceremonies. The rose growers of course followed the refugees taking their best varieties with them to plant as they resettled.

Consider then, first the sheer volume of rose water that had to be produced. Then consider just how much more productive the rose petal producer would have become if by growing a remontant rose he could have harvested petals over a twenty week period rather than the six week period of flowering from a once flowering rose.

Is it not more likely than rather than placating the hankerings of an enthusiastic Roman gardening enthusiast a far greater incentive for importing the remontant gene was religious and economic demand. The demand from an ever increasing population on the move, for the production of ever

increasing volumes of rose water? One sure way of meeting that demand was for the rose grower and rose water producer to introducing remontancy into their crop. Quite simply they were able to increase their production threefold at least! Little wonder they searched as far as China for a remontant rose.

Our research continues!

(Footnotes)

[1]Smail, Reverend Richard, Commentary on Roman Flower parties in Historia Augusta Elagabulus 21 (Loeb translation) e-mail to REM 06.05.09.

[2]Virgil: *Georgics* : Vol. 2 - Books 3-4 – P. 22.

[3]Villa Giulia is a villa in Rome, Italy. It was built by Pope Julius III in 1551-1553.

[4]Fildes A., Fletcher J., *Alexander the Great: Son of the Gods* Getty Publications, 2004 p.67.

[5]Wood M., *In the Footsteps of Alexander the Great: A Journey from Greece to Asia* University of California Press, 2001 p.92.

[6]Kiani M. Zamani Z. Khalighi A., Fatahi R., Byrne D.H. *A UNIQUE GERMPLASM OF DAMASK ROSES IN IRAN* ISHS Acta Horticulturae 870: V International Symposium on Rose Research and Cultivation.

[7]**Iwata H., Kato T.,** & Ohno S. *"Triparental Origin of Damask Roses,"* **Gene,** October 2000.

[8]Rix, Martyn & Phillips, Rogers *Roses* MacMillan 1994 p.34.

[9]Rix, Martyn & Phillips, Rogers *Roses* MacMillan 1994 pp.23, 214.

[10]Huxley, A., ed. (1992). *New RHS Dictionary of Gardening*. Macmillan. p.28.

[11]Wang *A STUDY ON THE HISTORY OF CHINESE ROSES FROM ANCIENT WORKS AND IMAGES* 2007 ISHS Acta Horticulturae 751: IV International Symposium on Rose Research and Cultivation ISSN: 0567-7572 vol:751 pages: 347-356.

Fig. 1. *Rosa damascena*

Fig.2: *The Roses of Heliogabalus* (1888) by Sir Lawrence Alma Tadema

Fig.3: Roses in the frescoes painted on the ceilings of interior colonnades of Villa Guilia, Rome.

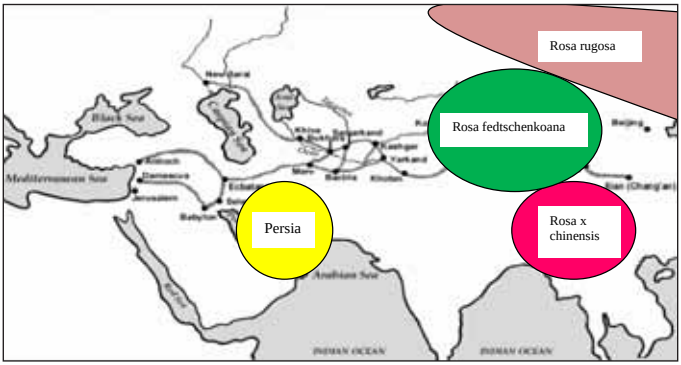

Fig.4: Distribution of recurrent flowering rose species and their distance from Persia

Fig. 5: *Rosa x damascena*

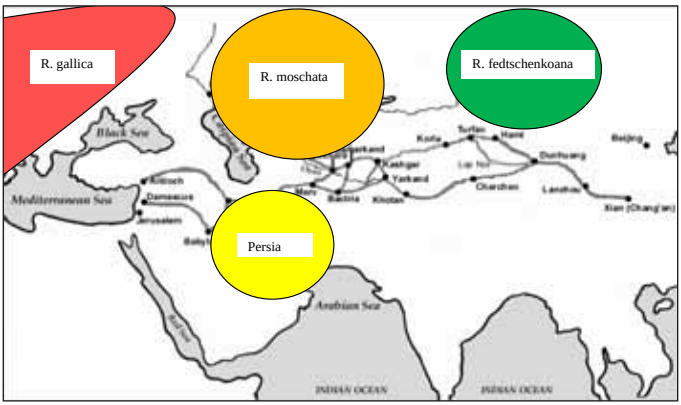

Fig.6: Diagrammatic map illustrates the disparity in the geographical distribution between *Rosa fedtschenkoana*, *Rosa moschata*, and *Rosa gallica.*

Miraculous Old Rose 'Baoxiang' in China and 'Kakinada Red' in India

Professor Guoliang Wang

China and India are two of four ancient civilized countries of the world. About 2000 years ago, the two countries started sharing the benefits of Buddhism, silk products, fruit plants, traditional farming culture, and the long common border.

Nearly 250 years ago, Calcutta in east India was the main trans-shipment station through which the old roses which had been discovered in China, were introduced to the west, from the area of Fa Tee to London, and then to Malmaison Castle in France, the rose garden of Empress Josephine. It was from this period that a lot of Chinese old rose varieties and native species swarmed into India. Besides the rose varieties and species illustrated in *Indian Flora* written by Reeves, I believe there are many more old roses existing here, many of which never reached Europe. What people may not know is the fact that some Chinese old roses had been already, in earlier years, taken into the ports of India by Chinese seamen, while sea trading abroad, during the Ming Dynasty, about 600 years ago, because they were accustomed to take some potted roses on board their boats, to cure them of their homesickness during their long voyages.

In this lecture, I would like to focus on the comparison of the old rose 'Kakinada Red' popular in India, with rose 'Baoxiang' in China, and the evolution and identification of the latter, because this is not only a world-spreading historical rose, but is also a rose of mystery.

1. The ancient roses from China to the West by the Silk Road.

In 138 BC, during the Xihan Dynasty, officer Zhangqian,

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the pioneer to the west, was dispatched by Emperor Han Wu Di to fulfill the maiden expedition to the outside world in order to create the world-famous Silk Road, the full length of which is more than 7000 km. Since then, many fruit plants and goods were exchanged on the road linking China to the west. Unfortunately I have not yet found any direct evidence to support my guess that there may have been some Chinese roses among the exchanges. But in fact, the figure with double wings on the fresco called 'Angel with Wings' excavated in Xijiang (1700 years old), was verified, and the appearance is just the same as the one with the name of Jilingpinjia in Chinese, the one of Three Gods of Buddhism, in India. That means at least about 1700 years ago the exchanges on the Silk Road influenced the two countries.

Fortunately, my guess finally came to be true in the evidence of Double Rose Painting in frescos of the 3rd-4th century, excavated in the No.5 temple in Ruoqian County in Xijiang (Figure1). Of course, there are several native wild rose species with white or red flowers locally, just like *R. beggeriana*, *R. acicularis* and so on, but the forms with double red flowers are never be found in the wild. So it is likely a remnant of an exchange from inland China.

2. The comparison between 'Baoxiang' in China and 'Kakinada Red' in India.

As we all know, the route of Chinese old roses to the west was from Fa Tee to Calcutta, then to England, to Malmaison, and so on. I once followed the route, and experienced the whole journey of the magnificent plant introductions and transportations by sea. But what I really try to present to rose friends all over the world is the comparison and identification of the old rose 'Baoxiang' in China and 'Kakinada Red' in India, because nowadays they have the various names in different countries, such as 'Pacific' in Bermuda, 'Maggie' in America, 'Kakinada Red' in India, and 'Baoxiang' in China, the ancient but new name named after my recent investigations.

There are many people who are very interested in this miraculous old rose, and who would like the truth revealed. So it is important for me to spend some time on it.

2.1 'Pacific' in Bermuda

Although Bermuda is a small island in the Pacific Ocean, numerous 'mystery old roses' have been found there. Most of them are related to Chinese old roses. The found rose called 'Pacific' there can be regarded as a representative.

It is said that the rose was taken to the island by Captain Samuel Conyers Nelmes (1777-1867) who was on a voyage in the Pacific Ocean. Rosarians in Bermuda say the same rose can be seen in Fiji and in other Caribbean islands. The rose 'Pacific' features long canes, very fragrant blooms, in clusters, changeable color from pink to crimson with the local weather, flowering constantly on short stems. Especially its nickname "Cabbage Rose", revealed the unique shape of flowers.

2.2 'Maggie' in America

About 'Maggie' in America, my friend Gregg Lowery once wrote, "this great old rose continues to be unraveled." I totally agree with his view, because he is taking a great concern in searching the history of this rose. He might jump with joy if he knew it originated from China. When I visited New York in 2011, my rose friend Stephen Scanniello, the knowledgeable rosarian, showed 'Maggie' in a public cemetery heritage rose garden to me. That is a really impressive old rose plant.

'Maggie' in America was found by William Welch in his mother-in-law's garden in Louisiana, so, logically, it was named for her. Now, 'Maggie' has proved to be a widely adaptable old rose, thriving in climates varying from tropical to cold winter weather.

2.3 'Kakinada Red' in India

'Kakinada Red' was named after the port town in India by Girija and Viru Viraraghavan. That is one of the most

interesting old roses there. The rose couple pointed out, in their article 'Mystery Roses of India' (in Rosa Mundi's publication, 'Mystery roses Around the World') "While the roses we have mentioned so far appear in various historical records, they have not yet been located in present-day India." Based on their researches, much more important is the rare rose which has existed there for a long time. So the rose 'Kakinada Red' is certainly an exotic old one.

Kakinada Red is used in garland making, it has few prickles, is semi-double to double, is nicely scented with more of a sweet fragrance than a damask scent (Fig2).

2.4 'Baoxiang' in Japan

Japan lies very near China. At least 1300 years ago, students from Japan started to introduce Chinese ornamental trees and flowers back home for their garden decoration. Among plums, camellia, peony, chrysanthemums, and so on, of course there are lots of Chinese old roses. For example, the monthly rose called 'Old Blush' in the west, but 'Konshibara' in Japanese, meaning a perpetual rose, was introduced in Japan ca. 1300 BC.

In *A Collection of Illustrative Shiowa Herbals*, the rare book published in 1703 in Japanese, I encountered images with two colors, and the old Chinese characters 'Baoxianghua' was written on the top right of image (Fig.3).

However, Fig. 3 shows us a peony-like old rose, absolutely not the rose 'Baoxiang'. Till recently, the tree peony-like rose was easily seen in Sichuan Province. That means the author incorrectly regarded the peony-like rose as rose 'Baoxiang', but he must have known that there was a rose called 'Baoxiang' or 'Baoxianghua' in China.

2.5 'Baoxiang' in China

Baoxiang in Chinese, means, literally,' Royal Portrait'. It usually refers to the Portrait of the Buddha. The two characters appeared in Han Dynasty, about 2000 years ago. At that time

it was just the pattern of Lotus, very near to the lotus-style on the Portrait of Earth-Goddess excavated in Indus River in India, 2500BC- 1600BC.

In the Southern Dynasty (420-589) of China, Baoxiang-like pattern on eaves tiles, clothes, celadon plates were very popular, showing a vivid five-petalled lotus with a small pointed terminal (Fig.4).

In Tang Dynasty, the Baoxiang became a standard pattern which combined lotus and honeysuckle (Fig.5). Articles with this attractive pattern were admired and collected because they denoted signs of wealth and rank.

That is an almost bilateral symmetry drawing, imbricated with multiple outer petals of lotus, and decorated with inner petals of honeysuckle.

Until the beginning of Song dynasty, about 1000 years ago, the Baoxiang pattern was involved with one kind of monthly rose, the rose 'Baoxiang'.

During the period of 1000 years from Song Dynasty to Ming Dynasty, then Qing Dynasty, numerous written records have been found which document this rose.

In this article, I can not describe all the written records derived from the ancient works. So I will talk of some important materials, for an outline of rose 'Baoxiang', the ancient rose variety which possesses a history of more than 1000 years.

First of all, 'Baoxiang' is a very unique and attractive variety in ancient China. It was so rare that all rose lovers could not get in touch with it. At that time, even most of officials of high rank did not receive it. Li Zhi (947-1001) has a poem of thanks for getting a 'Baoxiang' flower from his friend: 'rose 'Baoxiang' was transplanted here, so far away, it can not be reached by a normal family; with dark red petals, there is nothing more beautiful than that one'.

Secondly, 'Baoxiang' possessed the features of double flower, nearly round leaflets with sharp serrated teeth, strong fragrance, and was repeat flowering.

The third is 'Baoxiang' was a climber, used as hedge, canopy frame, and so on.

The most surprising thing to me are the two written records of 1000 years ago which tell us that the rose 'Baoxiang' originated in Chengdu, the ancient capital of Western Sichuan. For example, Li Fang (925-996) said in his poem: 'Baoxiang' is the name of a rose, introduced from the capital of Chengdu, Sichuan; the appearance is very different from other roses, so the variety is rare and much more precious. That means 'Baoxiang', like 'Old Blush', was also born in Sichuan province.

Much more detailed information on 'Baoxiang' was found in the rare specialized rose book titled *The Collection of Rose Varieties and Their Description* in Qing Dynasty, published in Chinese about 200 years ago. The item on 'Baoxiang' is described as follows: Red and broad vivid petals; Cup-like flowers; Glorious petals; Green leaflets with sharp serrated teeth; leafy flourishing bush with strong branches; Semi-climber. This in fact is almost the shortened conclusion of the ancient written records mentioned above.

According to the analysis of various Local Chronicles from Song dynasty to Qing dynasty, 'Baoxiang' was planted widely in northern and southern of China, such as Chengdu, Luoyang, Kaifeng, Fuzhou, Xuanzhou, Hanzhou, Ningbo, Suzhou, Wuxi, Yixing and Zhenjiang, et.al. The distribution area of 'Baoxiang' in Song Dynasty to Qing dynasty covered almost half of China

Based on the study of the written records of 'Baoxiang' in history, the investigation in situ was conducted by myself. Fortunately, the living 'Baoxiang' was found separately in Tengchong, Yunnan province, Chengdu, Sichuan Province (Fig.6), and Nanjing, Jiangsu province. The main

characteristics of all are the same except for slight color variations.

3. The Identification of 'Baoxiang' in China

3.1 'Pacific', 'Maggie', and 'Kakinada Red'

The genetic analysis of 'Pacific', 'Maggie', and 'Kakinada Red' which were conducted by Professor Anne Bruneau of the University of Montreal, Canada, showed that all three are the same. Professor Malcolm M. Manners of Florida Southern College, directed his student, Ashley Wilson, in 2011/12 to do a comparison of them all, and they proved to be the same rose as well. From the molecule level, the three roses have been verified to have the same origins despite being far apart from each other.

3.2 The identification of 'Baoxiang' in China

Up to now, the evidences composed of ancient written records and living roses in China have been presented in this article. Could the ancient paintings or images that are related to the 'Baoxiang' be found? I spent a lot of time researching about rose 'Baoxiang'.

Nothing is impossible for a willing heart. Just as I had hoped, one ancient painting and an enamel painted plate came to my notice.

The painting, painted by Huang Jucai, an extremely famous court painter in the Five Dynasties (907-960), was an eminent example of realistic drawing of plants and flowers at that time. It was showed to us, in exact detail, the main features of 'Baoxiang' a thousand years ago.

The porcelain plate made in Emperor Yongzheng period (1722-1735) shows three flowers and four buds, and some branches and flowers to be continued on the reverse side, and the vivid and realistic 'Baoxiang' pattern is almost the same as the real.

The reason why I can use the word realistic is the procedures used were restricted by court requirements. Just

the selected biscuitings made in the court kiln in Jingdezhen far away could be used for the candidates. The court painters presented their pattern paintings to the Emperor Yongzheng, then they had to be described exactly on the plate, and eventually fired in the palace kiln after getting his permission. So such a complicated rose flower pattern as 'Baoxiang' was presumed not to be a vision, but a realistic skeleton or color copy. That means the rose 'Baoxiang' had already been planted in the palace in Beijing as well about 300 years ago. (Fig. 7)

Briefly mentioned above, all evidences from various Chinese ancient written records, from ancient Baoxiang-like painting in the Five Dynasties, from rose Baoxiang pattern on the plate made in Yongzhen, and the live old rose 'Baoxiang' collected from northern and southern part of China, comes to support the view that all are the same. The main features of 'Baoxiang' which occurred in different periods in China are also very similar to the rose called variously 'Pacific', 'Maggie', and 'Kakinada Red' outside China.. They would have been called 'Baoxiang' in Chinese 1000 years ago.

In conclusion, the rose' Pacific', 'Maggie', 'Kakinada Red', and 'Baoxiang', all possess almost the same features. This unique and outstanding old rose is just under different names, they are morphologically identical to each other. Although there is lack of much more direct evidence from the genetic analysis including the'Baoxiang' with the others, I hold strongly positive attitude that they might be the same. If so, just like 'Old Blush', all of them are derived from Chengdu, China. Of course, another Baoxiang-like rose, 'Eugene E. Marlitt' bred by Rudolf Geschwind in 1900 has not yet reached my hands. Obviously that was a western rose. So, for telling the complete story of 'Baoxiang', much more exact genetic sequence comparison has to be done, by collecting all the likely candidates, both in China and abroad. I hope that day is not far away.

Fig.1. A red double rose pattern on the fresco excavated in Xinjiang (Preserved in India State Museum), about 1700 years old.

Fig.2. Kakinada Red in India (photo by Girija and Viru Viraraghavan).

Fig.3. An illustrative image described the name Baoxianghua in Chinese old characters.

Fig4 The Baoxiang, lotus style pattern on a celadon plate in the Southern Dynasty (Collected in Nanjing City Museum).

Fig.5. The standard pattern of Baoxiang in Tang Dynasty, about 1300 years ago.

Fig 6. Baoxiang in Chengdu, showing distintinctive five imbricated petals which look like five hearts in an entire flower.

Fig.7 The enamel painted porcelain plate with rose Baoxiang pattern made in Emperor Yongzheng period.

Roses in Pakistan

Dr. Mahmooda Hashmi

Having immense beauty, unique fragrance and matchless grace, the rose is the most admired and loved flower through out the world. Its interest continues to increase day by day. Talking about roses in reality is a matter of joy and delight. Rightly said by a poet " Rose is the perfume of God and Joy of men". The important aspect is that it is not the beauty and perfume that we enjoy and is not only meant for immense beauty, diverse colors and mesmerizing fragrance, it is symbol of deep reverence, love, affection and a token gesture of respect and gratitude. Its beauty teaches us the outlook we must have towards life, its silence expresses modesty and its splendor shows us the art of grace. So let this marvelous gift from God Almighty show us the way to give solace, joy and fragrance all around. Let us learn the lesson from rose to give out what is good only and make this World a better place to live. In the medieval times classical painters used to believe that roses fell from heaven and considered them to be the symbol of Gods divine love. Just a glimpse of rose makes one fell in love with nature and one cherishes to live longer for the mere pleasure of enjoying its beauty and fragrance.

The three main groups of roses are Species or Wild Roses, Old or Heritage Roses, and Modern Roses.

Species roses carry the Latin name "Rosa". These are wild Roses, naturally perpetuated and occur with no help from man - a true wild flower. These are non-recurrent with very few petals 4 to 6, blooming in late spring or early summer followed by hips. When adventurers and travelers brought species together that would never have met naturally, it resulted in a lot of change - by hybridization. Through the

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process of mutation, selection and crossing over, many beautiful old garden roses were born.

Old World roses, were grown in the gardens of Europe and Asia for hundreds of years. Old roses were originally derived from Wild Roses but it was the trade with Asia that brought a flood of important rose species into Europe and other parts of the World. In other words these wild roses were the ancestors of practically every modern rose.

Recently, there has been a great surge of interest in old roses. These consist of all the classes that were in existence before 1867. Gardeners of today are in love with the disease resistance, fragrance, hardiness and old-fashioned flower forms. Features of these roses also include rounded flat tops with many layers of petals; grown on their own root stock.

There are many types of old Garden roses like Gallica Roses, *Rosa Mundi,* Damask Roses, Centifolia or Provence Roses, Alba Roses, China Roses, Old Tea Roses, Portland Roses, Bourbon Ross, Hybrid Perpetual Roses, and Noisette Roses etc.

Modern roses were introduced as a class of roses in 1867 with the introduction of a French rose, *La France*. One of the most well-known hybrid teas is the *Peace* rose, which was introduced in 1945. Modern roses have been crossed to develop new colors, increased hardiness, disease resistance, and continuous blooming.

According to a survey of parentage of the modern roses, that we know today 48 species of wild roses are indigenous to China, 42 to other parts of Asia including Pakistan –India and more than a dozen in various parts of the Middle East.

The result of another survey shows, while deep red roses are found growing wild in China, deep yellow roses as well as the few which can flower through out the year are found growing wild in Central Asia only. From these facts it is quite evident how rich Asia is in wealth of roses. In fact it was from these basic colors of the wild roses that contemporary hybrids

developed and man was able to create a variety of diverse shades with the development of scientific techniques.

Species roses found in Central and South Asia are actually the parents of the Modern Roses.

The Sub-continent of Pakistan and India, like other Asian countries is very rich in species roses and in fact is the cradle from where roses from the East were taken to the West.

For western horticulturists most roses coming from the East were equivalent of gifts from the East due to their many distinctive traits. Among their most precious assets are the length of flowering period, ability to mutate, attractive foliage, rich diversity in habits of growth and forms of flower, new shades of colors and of course, their overall loveliness.

Species Roses indeed have a very old association to boast. Pakistan and India being close neighbors have common borders and also roses in common.

Species roses are the oldest and true natural roses in this part of the world. In other words Subcontinent of Pakistan and India has had the privilege of being the Home of Wild or Heritage Roses. Dr. B.P. Pal, Ex Chairman of the Agriculture Research Council of India and Ex President of Rose Society of India, in his book "The Rose in India" has mentioned the wild and species Roses in India. Those mentioned in his book are some of the same mentioned in my book "Indigenous and wild Roses of Pakistan". In fact a number of species or wild roses were discovered in this region.

This can therefore, be claimed without hesitation that Pakistan and India embodies within its boundaries numerous species of natural roses. In Pakistan assortments of wild roses or Rose species are specially found in the Northern parts of the country where they are flourishing in abundance. While a number of them have been identified and named there are some species of the wild roses that are growing wild and still awaiting identification.

It is therefore appropriate to say that Asia including Subcontinent of Pakistan -India is the real abode of roses.

Now I will discuss about some of the popular roses in the Subcontinent with special reference to roses in Pakistan.

Alba Rose : A beautiful Alba rose bush makes a very elegant addition to the garden. They thrive even under difficult conditions. The blooms last for several weeks. Alba is a Latin word for white, and this was the color of all the early Albas also known as the 'white roses'. The bush has bright green or bluish foliage and white semi scented flowers. The original Alba rose was not a true wild rose and probably originated as a natural hybrid and derived from two different species (*R.canina* and *R. gallica*).These old garden roses tend to be tall, strong and long-lived and are very disease resistant.

People have now started growing this variety in their gardens and it has also been successfully cultivated in Islamabad, the Capital City of Pakistan. Its petals are rather thick and rough. A vigorous fragrant climber found in valleys of Swat, Chitral and Ziarat in Pakistan. The white rose of York is usually considered to have been derived from this species. It was brought to England by the Romans.

Rosa Macrophylla Lindley : One of the most beautiful Himalayan wild flowers, *R. macrophylla* is a deciduous shrub growing to 4 m (13ft) by 3 m (9ft) at a fast rate. Though found growing wild in the Himalayan range forests of Pakistan, in scrub and open forest it can also be found in India, east wards in Afghanistan Nepal, Bhutan and western Yunnan and south East China.

It is a large erect shrub up to 5m high, often with dark red or purple stems, with rich or deep pink flowers having some scent. Leaflets oval, around 5cm long. The flowers, borne singly or in clusters, are 2 inches in diameter. It is the largest fruited of roses. The fruit is oblong, flask or bottle shaped and very large ripening to a bright red color, and is edible.

The shrub produces solitary dark-red five-stellate flowers from June to July. Once-blooming, spring or summer.

In Pakistan it is commonly found in Parachinar, Murree Hills, Kurram, Chitral, Swat and Hazara.

Mardan Rose: Another very popular beautiful well-known garden variety is *R. Laevigata*, called Mardan rose named after the city of Mardan in N.W.F.P. (Khyber Pakhtoon Khah Province of Pakistan). It is believed that during the mid 19th century a rose loving Colonel of Guides Cavalry stationed at Mardan, during one of his expeditions to the valleys of *Swat* and Dir found this shrub/climber growing naturally. He got so excited at its pure white flowers and parrot green foliage, that he asked his staff officer to get a few small plants of this rose which he planted in his bungalow at Mardan. Later he gifted some plants to his friends, who he knew were also keenly interested in gardening.

Some Western scholars also saw it growing for the first time in Mardan and named it after this town. That is how the rose came to be known as Mardan Rose. Mardan is one of the most fertile districts of Pakistan. It is also strategically important because roads leading to Swat, Dir Chitral and the adjoining tribal areas pass through it. So instead of being named after remote valleys of Swat or Dir it got the name of a very well known and culturally important town of Mardan. The Rose is white with a gold center, easy to propagate from cuttings. It succeeds in both wet and very dry sandy soils, likes full sun but tolerates some shade. It has two colors, white and pink. White is quite common, pink is rare. Mardan Rose has been identified as *Rosa laevigata,* Michaux, Triphylla or Cherokee rose. The botanical name of Mardan rose as given by Dr. B.P.Pal is *Laevigata* Michaux. In Pakistan it is known as Mardan Rose whereas in the USA and Europe it is called Cherokee. Laevigata means polished smooth (with reference to the glossy leaves).

Mardan White is quite common in Mardan, Peshawar, Islamabad and some other towns of Pakistan. A robust evergreen climber up to 10 m or more, with hooked prickles and bristles on the smaller branches. Leaflets acute and leathery in texture, stipules deciduous. Growing wild in rocky places and near streams flowering March to April. Does well in warm, sunny positions. Flowers poorly in areas of heavy frost and is not especially hardy in cold climates.

However it has slight fragrance and its tall, dense foliage and sharp thorns make it also suitable for hedging. It has five to six petals only. It is also naturalized in South America and North America. In 2011 it became the national flower of Georgia.

Rosa damascena: - (Damask Rose). This is really a very old rose. The earliest records of Damascena probably date back to the fifth century B.C. There are two groups of Damask – Summer Damask that flowers once and Autumn Damask, which has a second flowering in Autumn. The Summer Damask is a hybrid between *R. gallica and R. phoenicea.* It flowers in bunches with lots of elegant buds which are highly fragrant, bright pink, double flowers with crinkly petals and long sepals. The foliage is downy and grey-green. For this reason, true *Rosa damascena*, has been sold at a higher price, not just in recent times but also for a very long period of time. The Autumn Damask is a hybrid between *gallica* and *R. moschata*. They are rather less hardy than *Gallicas*.

Rosa damascena grows wild in some areas. The one having a pink shade is better in quality. The flowers are often, pink or white in color and semi double or double.

Though it is not exactly known as to when *damascena* was brought under cultivation in the sub-continent, one thing is certain that it has been grown and used by the people in this region for very long. It is therefore considered indigenous as it has not only been grown for extraction of perfume and rose water since ages but has also been found naturally or wild in some parts of the country.

Living up to the image created by its beautiful name, Damask Rose embodies in itself a fragrance that is most useful for perfumery. It is in fact one of the two main botanical varieties of the rose used for the synthetic production of scents. This statement can be testified from the fact that *Rosa damascena* was cultivated both in Persia and subcontinent for official purposes and is the kind from which rose-water and rose oil are usually obtained. *Rosa damascena* is among the most fragrant of old garden roses and nearly as ancient as *gallicas*, to which it is closely related. The earliest records of Damascena or Damask probably date back to the fifth century B.C. This was the flower that was used in Roman banquets and was used to decorate the ship in which Mark Anthony was to leave, departing from Cleopatra.

It was used to make perfumes, attar of roses, rose water and purgatives.It flowers in bunches with lots of elegant buds which open into highly fragrant, bright pink, double flowers with crinkly petals and long sepals. The foliage is downy and grey-green.

Rosa Canina* or *Rosa Corymbifera (Dog Rose in Europe): The most common wild rose, summer flowering, found in the Northern Hemisphere. The flowers of most species roses have five petals. Each petal is divided into two distinct lobes and is usually white or pink, though in a few species yellow or red. Beneath the petals are five sepals. Dog Rose, is often called incorrectly as rosehip. The name dog rose came from the fact that traditionally the roots of the dog rose would cure a bite from a mad dog and more probable theory states that it was the Dag Rose - 'dag' being a dagger - because of its great thorns, and like the 'Dogwood' (originally Dagwood) became changed into 'Dog' by people who did not understand the allusion. The dog rose is the Flower of Hampshire. Solitary scented flowers are light pink to white, generally pale pink. The abundant fruit is oval and scarlet. Suitable for woodland planting as it tolerates poor soils and shady positions. It can be grown on the south facing walls. Often used as a stock for

budding Hybrid Tea roses. It is a native of Western Asia and Europe except the far north. In Pakistan it is found growing wild in Swat, Chitral, Kalam, Utror and Hazara, Poonch, Astor and Ziarat.

Rosa Foetida: *Rosa foetida* is a milestone in the history of rose. Its origin is Iran but the word Foetida is a Latin name for the smell. The plant blooms in early spring to mid-summer, Flowers are single, deep yellow or orange in color with five-petals and bright yellow stamens. *Rosa foetida* grows well in sun, sandy loam to clay loam, and normal to moist soil. These yellow roses were introduced to other parts of the world. It is also native to the foothills of Caucasus Mountain in Georgia.

Rosa foetida is a vigorous shrub that is very susceptible to black spot. It has medium to dark green glossy leaves There are four types of Foetida:.

a- *R. foetida* Hermann(R. Lutea Miller),

b- *R. foetida bicolor*

c- *R. foetida* or *Rosa xanthina*

d- *R. foetida Persiana*

a-*R. foetida* Hermann, is a medium height vigorous bush or a shrub. Flowers are bright yellow cup shaped, around 6 cm across having sprouting shoots from the root. Petals often suffused with red. Sepals becoming leafy at the apex. Hips dark brick red. A good garden plant, very decorative bush when in flower. The shrub bears yellow single flowers, heavily scented rather sickly sweet odor rather unpleasant, Hips rich in vitamin C, found growing wild on the rocky slopes up to 2850m Flowering from April to June. Found in Kurram, Hazara, Quetta and Ziarat of Pakistan. Its place of origin is considered to be Asia Minor and Middle East. Native of West Asia

b-*Rosa Foetida* Bicolor (R. Punicea Miller):- The flowers take on a red color in the upper part of the petal yellow in reverse, although the flowers and the branches some time

may revert to original or plain yellow, this produces a pleasing contrast. The color is orange scarlet inside and yellow reverse. It is, in fact, the first example of a bicolor rose.

Frequently grown in warm climate. The flowers have sweet odor. Summer flowering prone to black spots, height 8 ft, *R. foetida* being pollinated by bees.

In Pakistan it is usually found in Swat, Kalam, Utror and Hazara.

c-*Rosa foetida* or *Rosa xanthina*- A shrub of medium height 8 ft having very small leaves. The flowers are deep yellow scented and only one inch in diameter, are borne singly on short stems. Found in Chitral, Drosh, Bumboret, Kurram in Pakistan and some other areas adjoining Afghanistan. Though its origin is Iran but is also found in our region of Baluchistan neighboring Pakistan

d- *R. Foetida Persiana*-As the name indicates, its place of origin is Persia(Iran) but due to the proximity with Pakistan as a neighboring country and similar climatic conditions, it is also found growing in our region of Quetta and Ziarat in Pakistan.

Hemisphaerica (Herrmann, R. Rapinii Boiss & Bal-) Yellow. Having mild fragrance large, very double, button-eye, globular bloom form. Once-blooming in Spring or summer. Similar to *Rosa foetida*, summer flowering, a low shrub, growing on dry slopes and roadsides from 800 to 1800m; often cultivated within that range. Requires heat and drought in summer to flower well. It is a much branched bush up to 1.5 m, with many strong curved or hooked prickles. Leaflets not strongly aromatic, grey green, flowers 4-5 cm across, petals rather pale yellow, hips orange red or yellow.

It is a native of Iran, Pakistan, Turkey and Soviet Armenia. In Pakistan, it is found growing in various parts of Baluchistan Province.

Rosa Odorata Pakistana, as the name points out originated in Pakistan. The flowers are pink small but double

and fragrant. Some people trace its origin in China, but since it grows wild in Swat, Buner & Chitral it could without hesitation be considered as indigenous to these areas. The fragrance of this rose resembled tea being imported from Bengal therefore were erroneously called as Bengal rose. The fragile silky flowers, earliest heralds of spring, open one by one indoors to remind everyone that warm sunny days are at hand.

Rosa Bracteata: Meaning the 'roses with Bract', bracts being leafy growths unusually close to the flower. Other roses have bracts too but they are specially noticeable in *R. Bracteatae* and *R.Clinophylla* which is the only other species in this sub-family. The leaves are dark green, with hairy and prickled stems, and glossy. The flowers are large, white, lightly scented with prominent yellow stamens borne over an extended period, late spring to autumn. Hips orange red. The fruit is round and orange. May be grown as ground cover or climber. It is also known by the names Macartney Rose and Chickasaw Rose. It is a rather fragile flower and requires a warm wall even in the warmest of areas. It is found in valleys of Parachinar, Chitral, Swat, and Kalam ln Pakistan.

Rosa Moschata (Musk): Another Himalayan Rose-Beautiful and an important fragrant rose *Moschata or Musk* known to the classical world. It is a species of rose which has been in cultivation for long. Its wild origins though uncertain are suspected to lie in the western Himalayas. This species has historically been confused with Himalayan Musk Rose, a closely related, tall-climbing species from the Himalayas that bears flowers in late spring and which possesses a similar, musky scent. It is remarkable for the curious derivation of its name, from Persian *mushk* meaning Scrotu, repository of the Musk deer alluring scent. The specific name Moschata, or Musk is therefore derived from the scent emitted by anthers, similar to that given out by a gland of the mushk deer.

Moschus moschiferous, a rare component of expensive perfumes.

John Keats has rightly said:-

And the Rose herself has got

Perfume which on earth is not

Musk is a robust climber up to 10m with erect shrub having flowers white or cream, single fragrant flowers, although semi double and double forms having light- or grayish-green leaves have 5 to 7 ovate leaflets with small teeth are known. Leaflets broadly or rarely ovate, acute or acuminate at apex, smooth and shining above. Flowers from June to September. Its smooth branches and leaf stalks distinguish it.

It is a native of Iran, Afghanistan and the western Himalaya. In Pakistan it is a fairly free growing climber found in Gilgit, Swat, Chitral, Tirah, Parachinar and Ziarat in Pakistan

***Rosa Webbiana* Wall ex Royle:** This is a famous rose of Himalayas. The flowers are single and lilac pink, some times with white center or all white. These are slightly scented with prickly leaf stalks and yellow stamens. Hips are bottle-shaped or globular. Fruits are red, flask- shaped, 3.5 cm. A medium size bush or dense shrub, 1.8m (6 ft) or in small bunches with arching stems of plum brown, purplish pink when young. Leaves are small, rounded. leaflets are obovate, almost round, obtuse Pedicels are smooth or glandular, often, purplish or reddish, as are the young shoots. Yellowish thorns are found at the base.

This variety needs sheltered position in cold climates. Tolerates poorer soils and some shades.

It is a native of Western Himalayas. In Pakistan it is found in Parachinar, Dir, Chitral, Gilgit Swat, Kalam in the northern areas and in some areas of Baluchistan province. The common Pink rose of the W. Himalayan.

There are many other Species Roses such as-*Rosa eglenteria, Rosa graciliflora, Rosa glutinosa, Rosa kokanica, Rosa*

lacerans, Rosa parvifolia, Rosa nanathomus, Rosa playacantha, Rosa sericea, Rosa sulphurea, Rosa ecae, etc…..I have mentioned these in my book" Indigenous and Wild Roses of Pakistan"

Conclusion

In the above I have highlighted not all the species of roses that are growing wild in the mountainous terrain of Northern areas of Pakistan but only some of the named and identified roses. However, there are still a number of species, which have recently been located and are yet to be named. The irony however is that most of these regions are either inaccessible or remain unexplored. Never the less, these are very old, certainly parents of new roses. The different colors, shades and varieties were introduced from these roses.

I would like to conclude my talk with the following verse:-

The history of beauty and colours has shown,
In Pakistan beautiful, wild roses have grown,
In colours, red, yellow, pink and white,
Blessing our country with loveliness and delight

Mahmooda

Rosa alba

Mardan rose

Rosa damascena

Rosa canina

Rosa foetida

Rosa hemispherica

Rosa indica odorata

R. bracteata

R. moschata

R. webbiana *Rosa macrophylla*

Rose breeders of India

Dr. N. K. Dadlani

The creation of new forms of plants is a fascinating subject. In the case of rose, the pleasure is increased manifold by virtue of the nature of the subject. It was India, from where through the port of Calcutta, in the days of East India Company, that the first Chinese roses (later referred to as '*Roses de Bengale*') found their way more than 200 years ago to Europe and then to North America. Most modern roses are reported to have descended from this material. The other important material, the musk rose of India – *Rosa moschata* also contributed to evolving the '*Noisettes*'. India is one of the ancestral homes of the rose since a number of wild species have been growing in the Himalayan region from time immemorial, with a small number of them endemic to India. Along with the scores of rose varieties introduced in the country from the western world over a period of time, the wild species provided an excellent base for the rose breeding work in the country. A report in early 1970s ranked India as number five in the world list of countries engaged in rose breeding.

Although garden roses have been popular in India from the time of the Moghuls, there appears to have been no Indian raised varieties of cultivated roses until the beginning of the last century. The earliest record available is of the variety 'Dr. S. D. Mukherjee' (1935) bred by B. K. Roy Chaudhury and 'Ramakrishna Dev' by B.S. Bhattacharji (1941). The quest for new varieties of this 'Queen of flowers' has continued in the country and we have been given the pleasure of enjoying them.

Rose breeding is a fascinating occupation. In India, there have been two distinct phases of rose breeding. Pre Independence, most of the rose breeding work was being done

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by nurserymen (like Bhattacharjis), with very little published information on the breeding procedures followed or the parentage of the varieties introduced. Post Independence, the rose breeding continued with the nurserymen, but there were important additions of several amateurs who also took up this fascinating line of work, besides the research institutions.

As mentioned, the rose breeding work was first taken up by the nurserymen in Bihar (not a popular area for rose growing even today). B.K. Roy Chowdhury and A.K. Roy Chowdhury at Mihijam (Santhal Parganas), and B.S. Bhattacharji and his sons (A.M. Bhattacharji & S.M. Bhattacharji) at Deogarh, as also S. Banerjee, laid the foundation for rose breeding work in India. 'Dr. S.D. Mukherjee' (1935) developed by B.K. Roy Chowdhury and 'Ramakrishna Dev' (1941) by B.S. Bhattacharji, were the first of the Indian bred rose varieties. After that there was a stream of rose varieties evolved by B. S. Bhatcharji and his sons, who between 1941 and 1968 introduced as many as 125 varieties.

Roy Chowdhury (*Dr. S.D. Mukherjee, Bagha Jatin, Dr.P. Banerjee, Muzibar)* and Bhattacharji (*Raja Ram Mohan Roy,Ram Krishna Dev, Heart Throb, Pandit Nehru, Sugandha)* from the eastern part of the country in the pre independence era, were followed by several nurserymen in the north, south and western India enriching the rose collections from India. The prominent ones among these include K.S. Gopalaswamiengar Son, Bangalore: (*Srinivasa, Agnihotri, Devdasi, Bharani, Nartaki, Blue Delight)*, Friends Rosery – Lucknow (*Kasturi Rangan, City of Lucknow)*:, Anand Roses –Jaipur: (*Golden Rays, Mahak)*, Doon Valley Roses - Dehradun: (*Ajanta, Sahasradhara,Landour, Rangoli)* Laveena Roses – Meerut: (*Chunmun, Maharaj*); TISCO Nursery – Jamshedpur: (*Suvarnarekha, Pioneering Pilot*), Ichalkaranji – Maharashtra: (*Deccan Delight, Double Delight Supreme, Dr. Noshir Wadia)*. K.S. Gopalaswamiengar Son (also known as K.S.G. Son) headed now by Kasturirangan, has done remarkable service to the Indian rose world by not only breeding new improved varieties, but also introducing the

varieties developed by amateurs into commerce. Another service provided by Kasturirangan has been providing access to a wide range of germplasm in the form of new varieties from across the world, which formed the foundation for rose breeding work by most amateurs. Sriram, Kasturirangan's son has continued the tradition of K.S.G. Son and helps his father in the rose improvement work.

Although the facilities of the amateur rose breeder and his knowledge of the subject may be considerably less than that of the professional, he may luckily discover a combination of varieties that a professional may overlook. Even if he fails, he would have spent many pleasant hours in trying to do so. Working with modern roses having very mixed ancestry, the results are definitely unpredictable. But there is always a certain amount of speculative uncertainty as to what the result will be, which adds interest to the work. The amateur rose breeders in India were drawn to this fascinating work from diverse fields like science, medicine, engineering, administration, etc. with very little or no knowledge about plant breeding. Except Dr. Pal, who was a trained scientist, all other amateurs have relied on their sense of beauty and culture in their work. The result has been tremendous. Many of the roses that beautify our rose gardens are the result of efforts of the amateur breeders whose main compensation has been the pleasure the work has afforded them.

Dr. Pal, who combined his sound scientific knowledge and considerable experience of genetics and plant breeding with an artist's sensitivity to form and colour, to give us a series of very popular varieties, e.g. *Rose Sherbet, Dr. Homi Bhabha, Delhi Princess, Mechak, Kanakangi,Raja Surendra Singh of Nalagarh, Golden Afternoon, Banjaran, Chitchor, Loree and Delhi Pink Pearl.* Later, M.S. Viraraghavan, a civil servant who preferred his hobby and pursued it with great vigor and vision and who used complex crosses, involving many parents to create a larger variability to base his selections, starting with *'First Offering'* gave us some beautiful roses including

'Priyatama' (first HT rose in the hand painted series in the world), *Mahadev, Kanchi*, *Vanamali*, *Priyamvada, Bhagmati and Abhaya 87*. These two, adopting highly scientific approach to rose breeding, have ruled the group of amateur rose breeders. The other prominent ones were Raja Surendra Singh of Nalagarh (*Yamini Krishnamurthy, Nazr-e-Nazar*); S. Banerjee (*Chamak, Jyoti)*; Y. K. Hande (*Ajanta Caves, Indian Pearl)*; M. N. Hardikar (*Swami, First Rose Convention, Flying Tata*); Braham Datt (*K.K. Thakur, Pride of Nagpur, Don Nielson)*; Arpi Thakur *(Ajanta, Sahasradhara, Rangoli)*; Swami Vinayananda (*Swami Shivananda, Bhikkus Som, Sivji, Swami Lokeswarananda);* N. V. Shastri (*Braham Datt, Double Helix, Govilgarh)*; S. C. Dey (*Sun God, Martin Luther King)*; Kalyan Chakrabarti (*Anusuya, East West, City of Joy, Birendra Nath)*; R. S. Jagtap *(Sudanshu)* Capt. S.C.Dey *(Arena series, including Arena 91, Arena 92 and Arena 95)* C.R.Chiplunkar *(Abasaheb, Dicdella, Dr.Kidwa)*, B.K.Patil *(ICO Ambassador, ICO Delight)*, Subrata Ghosh *(Lady Grace, Lonely Heart, Maya, Melody Queen)*, Shekar Dutta *(Touch of Heart).* M. S. Viraraghavan (Viru, as he is called by his friends), has added a refreshingly new approach to rose breeding in India, continuously enlarging his rose breeding horizon and candidly sharing his experiences with others. He has sustained his interest in developing roses suitable for the tropics and put rose breeding in India on the global horizon. Breeding roses for the hot climate is not an easy task, as it requires the daunting prospect of consciously reversing the basics of selection underlying western rose breeding over centuries. Further, using species, a major difficulty is that the F_1 generation roses are generally triploid and repeat flowering usually is seen in F_2 generation and beyond. Also, *Rosa clinophylla*, being genetically far removed from modern roses, is difficult to work with.

The 1960s brought in an era of scientific rose breeding. The credit for this must go to Dr. B. P. Pal, one of the most eminent and decorated agricultural scientist of the country, who took up rose breeding as a part time activity, besides

providing very powerful stimulus to the rose improvement programme at Indian Agricultural Research Institute (IARI), the premier institution for agricultural research in the country, which Dr. Pal headed at the time. The team led by Vishnu Swarup and including R.S. Malik, A.P. Singh and U.S. Kaicker, researched the rose genetics and cytology to gain insight about choice of parents, female and male fertility, inheritances pattern of flower colour, size and fragrance. The approach to rose breeding was more scientific involving genic manipulations, chromosome engineering using aneuploidy and induced mutations through both physical and chemical mutagens. The first set of varieties from this group came in 1968 and since then there has been a stream of very beautiful and floriferous varieties being released by IARI by the team which was expanded to include N.K. Dadlani, B. Singh, H.P. Singh and later K.V. Prasad and D.V. Raju. Some of the more prominent ones include *Mrinalini, Raktagandha, Jawahar, Bhim, Dr.B.P. Pal, Priyadarshini, Mother Teresa* among HTs and *Prema, Sadabahar, Neelambari, Chandrama, Mohini* etc. in the Floribunda group. The varieties developed through mutagenesis included *Abhisarika* and *Pusa Christina.*

Besides IARI, the other research institutions engaged in rose breeding include National Botanical Research Institute (NBRI), Lucknow, Bhabha Atomic Research Centre (BARC), Bombay, which have done good work on mutagenesis and released a few varieties; as also Indian Institute of Horticultural Research (IIHR), Bangalore.

The real skill required to become a successful hybridist comes not in simply applying the pollen of one bloom onto the stigmas of another, but in selecting the proper parents. Many of the amateurs in the early years did not pay much attention to this fact and chose as parents, the varieties that performed well and had their fancy. In a paper published in the Canadian Rose Annual in 1970, Dr. Pal listed varieties recommended by Rose Society of India for conditions similar to Delhi. Among the ten varieties each for exhibition and

breeding, only three namely *Kiss of Fire, Super Star* and *Virgo* were common. The well known rosarian J.L. Harkness (1969) had recalled a remark by a Scottish farmer interested in cattle breeding that when selecting parents for improving his stock, he followed the maxim: 'Choose a good bull and a reasonable cow'! A modern rose breeder would need to use all his knowledge and experience in identifying his 'bull' and the 'cow'. Not much is known about the parentage of the roses developed in India in the pre independence period, particularly by the pioneers Bhattacharji and Roy Chowdhury. Careful selection of parents and their choice as either seed or pollen parent, received more attention with the rose breeding work initiated by Dr. Pal at IARI in the 1960s. The IARI rose team did extensive research with the varieties used, testing their pollen fertility and ability to form more hips to decide on their use. Swarup *et al.* (1973) reported varieties like *Buccaneer, Charles Mallerin, Crimson Glory, Golden Splendour, Pink Parfait, Sea Pearl, Sweet Afton,* etc. with high female and male fertility to be good parents. *Delhi Princess*, an extremely vigorous floribunda developed by Dr. Pal was also used extensively at IARI. These varieties featured as parents for many IARI varieties released in the last century. Dr. Pal used *Granada, Gruss en Teplitz, Kiss of Fire,Lady X, Orangeade, Sabine, Samourai, Sonia* and *Virgo* among others in his hybridization work. Most of the amateur rose breeders have benefitted from the information on suitability of varieties to be used as parents as reported by IARI / Dr. Pal, to base their hybridization work.

As regards the breeding procedure adopted, most of the earlier rose breeders used seedling selections from raising a large population. Later, with the information available on the suitability of varieties as parents, many of the breeders resorted to hybridization process choosing parents with certain specific characteristics in mind and using the wild species. A few varieties have also been evolved through mutagenesis, particularly at the research institutes, and also

a few identified as '*Sports'* from the popular varieties. Among the 'sports', the climbing forms of some popular HTs are common.

Rose breeding objectives in India have been quite undefined. In the present days, the rose breeding programmes could be divided into two main areas: those intended to produce new varieties for the commercially important cut flower trade, and for rose gardens. In India, the second objective has received the attention of most rose breeders. While information on the objectives of earlier rose breeders is not known well, the foreword of the book 'Rose Growing in the Tropics' (1959) by B.S. Bhattacharji, mentions that the main objective in his programme was 'to produce some of the best hybrid roses for warmer parts of the tropics'. The objectives of IARI rose breeding programme were stated to be 'the production of decorative garden roses for sub tropical and tropical conditions, the incorporation of damask fragrance in recurrent blooming and floriferous varieties, the evolution of attractive long stemmed varieties with long lasting flowers suitable for export, also the production of disease and pest resistant varieties. Most amateurs have attempted to breed roses of attractive form and colour. Their target has been development of varieties with long buds and high centred flowers of classical form, preferably with sweet fragrance. Viraraghavan, in the recent years has sincerely committed himself to breeding roses for the tropical conditions, using wild *Rosa* species, particularly *Rosa clinophylla (R. involucrata)* and *R. gigantea.* His *Ganges Mist, Silver Dawn* and *Ganges Nymph* are from *R.clinophylla* and *Manipur Magic*, *Sir George Watt*, *Golden Threshold* and *Allegory of Spring* are some of his *gigantea* hybrids. The breeders across the country have not so far succeeded in getting roses for cut flower trade and with significant resistance to major diseases and pests. These two objectives need to be pursued with greater vigour by the research institutions with better resources in terms of manpower and finances.

The first impulse on holding a rose blooms in your hand is to smell it. It was the fragrance of the rose that endeared it to the ancients. Many of the Indian roses have also been developed keeping in mind this important attribute. *Sugandha* from Bhattacharji; *Rose Sherbet* and *Scented Bowl* and later *Kanakangi* and *Golden Afternoon* from Dr. Pal; *Jawahar, Anurag* from IARI; and several from the amateurs, e.g. *Devadasi* (Kasturi Rangan); *Double Helix* (N.V. Shastri); *Perfumer* (Y.K. Hande); *Mahak* (P.L. Airun); *Swami* (M.N. Hardikar); *Pride of Nagpur* (Braham Datt), among others.

In the absence of any protection for intellectual property rights in the country till recently, the main pleasure which the rose breeders derived from their efforts, was to give a name of their choice to their selections. While a name like *Banjaran* was appropriate for a rose with colourful petals like the dress of a gypsy woman or *Bhim* named after the Indian mythological figure with great strength was suitable for a rose with heavy petallage, and *Sugandha* properly defined the fragrant rose, or the *First Offering* – the first rose from Viraraghavan, many names were assigned to honour and pay homage to scientists and leaders who have contributed to development of the nation or the rose, social or cultural world. We have roses named after *Dr. Homi Bhabha*, *Sir C.V. Raman*, *Dr. B.P. Pal, Dr. M.S. Randhawa*, *Sir M. Viswesarya, Jawahar* (Lal Nehru); (Indira) *Priyadarshini; Mother Teresa,; Zakir Husain, Raja Ram Mohan Roy, Rabindranath Tagore, Flying Tata; Sailoz Mukherjea; Kamladevi Chattopadhyay;Yamini Krishnamurthy*; and even fellow rosarians like *Raja Surendra Singh of Nalagarh; Kasturi Rangan* or *Braham Datt*; or rivers like *Hemavathy, Netravathy, Vamsadhara, Tamarabharani* or just to honour people whom the breeder admired.

In spite of more than a thousand rose varieties having been bred in our country, one does not come across many Indian roses in the rose catalogues in the country or outside. Many amateur rose breeders, in view of the limited resources available, multiply only a few plants, which they share with

their loved ones or other rosarians. Most rose nurseries still stock old favourites among the exotic collections. As the Indian varieties are rarely exhibited in the rose shows, not many rose lovers are even aware of the wealth available. This leads to low demand and most nurseries not multiplying them. In the absence of trial grounds in the country, Indian roses do not get tested for their suitability for growing in other climates in the country or outside. Kasturirangan needs to be thanked for introducing the rose varieties bred in India by amateurs through his nursery K.S.G. Son. Lack of IPR protection till recently, also discouraged many rose breeders from putting their varieties in the commercial domain. However, this doesn't mean that Indian rose varieties have not received international recognition. '*Banjaran*' won prizes at rose shows in USA, '*Bharani*' – introduced in UK in 1980s received much attention. '*Mohini*', with its unusual chocolate brown colour attracted the attention of the leading American rose nursery Jackson & Perkins, who wanted to patent it.

The roses, which have been added to the large collection earlier available through the efforts of these Indian breeders, are a true testimony to the love and appreciation for this flower among the rosarians in the country. Most of the varieties bred perform well under the country's varied climatic conditions.

In spite of the progress made in rose breeding the world over, there is unlimited field for the improvement of garden roses. Even the most ardent rosarian will admit this fact, for no known rose is perfect, none has all the qualities we desire. We have yet to obtain a rose that is a heavy and continuous producer of well formed, fragrant blooms of rich colour, has good growth habit, is disease resistant and is dependably hardy to perform well in climatic zones of the country. So the quest goes on for a better one even today.

Homage

- Dr. B.P. Pal

Delhi Princess

- Dr. B.P. Pal

Abhisarika

- I.A.R.I.

Priyatama

- M.S. Viraraghavan

Braham Datt

- Dr. N.V. Shastri

Green Valley

- Subrata Ghosh

Rose Explorers from Italy

Helga Brichet

Italians have always loved travelling ever since the Romans marched across Europe and further east, and it is often said you will find Italians everywhere, even at the North Pole, probably selling ice cream!

The first Italian names which spontaneously come to mind when thinking of travellers and sojourners in Asia, are of course, Alexander the Great and Marco Polo. Whether these gentlemen noticed flowers along their roads is doubtful.

However there were numerous other men from the Mediterranean Boot who travelled east and, indeed, remained there for many years. And the reason for this, above all, was in order to carry out missionary work on behalf of the Catholic Church. Many, such as the Franciscan, Giuseppe Giraldi, were able to collect valuable herbarium material, which is still available for consultation today. (See *R. giraldii*)

One of the best remembered in China, but almost completely unknown in Italy, is Giuseppe Castiglione, born in Milan in 1688, who, at the age of 19, entered the Company of Jesus in Genoa. At the time the Portuguese, who had been the first to establish a permanent base in China, claimed the right to organize all missionary activity in India and China. Castiglione finally arrived in Beijing in 1715 and was presented to the Emperor Kang-xi, the second and by many considered the greatest of the Qing dynasty. The Jesuit became a court painter and remained there for some 50 years. The subjects which he was instructed to paint included figures of the imperial family and court, but also animals, hunting dogs, various birds and flowers from the imperial gardens. Those which have come down to us include roses – testifying to the

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degree of progress that rose hybridizing had made by the early 1700s in that country.

However with this lecture I should like to present the travels in search of roses of an Italian couple, Vittorio and Isabella Ducrot, in various countries in Asia, starting from the early 1970s.

Here the name Ducrot should not be misleading, for Vicky, as he is known to friends, comes from an old Sicilian family, and the islands of the Mediterranean have long been contended by many races, not least the Greeks and the Normans.

Vittorio, as he explains in his book, *A Garden for Roses*, had been a tour operator since 1974, and as such, visited many countries in order to verify the possibility of sending groups to exotic places in the East. As the couple's interest in roses augmented, these tours took on an increasingly botanical nature, and cuttings of the wild plants they encountered were taken to become part of their extraordinary collection in their "wild" garden in central Italy. Isabella remembers how embarrassed they were when holding up tour parties by openly showing just how crazy they were about roses!

Vicky has kindly lent me their photographic albums of their voyages.

Four trips were organized with the specific purpose of searching for wild roses.

1. Kashmir, May, 1991.

The Ducrots' last visit to this northern area in India which they had been visiting since 1973, - last visit due to guerrilla activity – was in 1991. It is situated between the mountain ranges of the Himalaya and the Pir Panjals at a height of about 1600 metres. About 20% of the land is covered by lakes and it is one of the most fertile regions of India with an astounding variety of plants. It was the preferred area for the summer retreat of the Mughal Emperors.

Several pink roses, *R. webbiana*, were spotted in the foothills of the Himalayas, as well as hedges of a double, thorny yellow rose, perhaps a variety of the *R. foetida* Persia. Near the Mughal Garden of Nishat there were large bushes of the *R. laevigata,* but also in local gardens – Indians love roses – there were many varieties, including an unforgettable, gigantic plant of "Fortune's Double Yellow," three storeys high in front of a house.

Now this is amazing testimony to the travel lust of roses: after all, the *R. laevigata* is native to south eastern China (in spite of some Americans naming it the Cherokee Rose, but that too could be explained), while "Fortune's Double Yellow," although first disclosed to European eyes in 1845 at Ningpo, was in all probability bred in south western China, either Sichuan or Yunnan.

In 1993 a short working trip to northern **Yemen** – now totally off bounds to tourism, and even then only with armed escorts - yielded large bushes of a rose similar to the *R. moscata* with solitary, single flowers near the village of Al Hajjara. Cuttings in the Ducrot's Italian collection today is never completely devoid of blooms, although there are two main flowering seasons in the spring and autumn. I am fortunate to have a large, healthy bush of this Moscata from Yemen in my own garden.

The only other rose they saw was a pink Damask with a wonderful perfume near the town of Shibam.

2. The second purely rose trip, in 1994, was planned along part of the **Silk Route** from Urumchi, the capital of the north western Chinese province of Sinkiang, where large bushes of wild, semi-double Rugosa roses, purple-red with excellent perfume, were found. These are named "Mai Kwai" and are found also in the south western provinces. From there the road climbed to the Tianchi Lake at an altitude of some 2000 metres, where an entire slope was covered with roses bushes with small, yellow blooms, emanating a scent between the incense of the *R. primula* and the stale butter of the *R. foetida*.

The chain of oases north and west of the Taklamakhan Desert leads to the great oasis of Kashgar, famous for its ruined Buddhist monasteries and their libraries. Along the road there were large bushes with silvery-green foliage and single, white blooms in corymbs of 20 to 30.Then the party travelled on to the trans Karakorum Highway and, via the Khunjerab Pass – 4590m. – down to the Pakistani Customs post in Sust and followed the course of the Hunza River until it met the Indus River. The Valley of Gulmit has wonderful landscapes of glaciers and many thorny bushes with pink flowers of varying shades with small, 7-8 leaflets, and brown branches. Here there was the amazing discovery of thick bushes of semi-double, red roses with a scent of the *R. foetida*, growing amongst hedges of the *R. foetida Persiana.*

The party then made a three-day deviation up the Indus Valley to the old principalities of Skardu and Shigar (Baltistan). Whilst there, the group visited local vegetable gardens and were allowed to see an enclosure behind a suspicious peasant's house, where a perfumed, semi-double Alba was suckering all over the place. The return was back to the valley of Swat, Peshawar and the Khyber Pass.

In June, 1996 the north of **Iran** was visited, not only for roses. In north western Iran the party visited the extraordinary mosque-mausoleum of Uljaltu, a 14th century Ilkanid Emperor. From the terrace of this monument glimmered a turquoise dome. Approaching, there were many yellow-coloured rose bushes: many *R. foetida* and even more *R. hultemia Persica*, not more than 20cm. in height. Two days later, near Takht-i-Sulaiman (Throne of Solomon), reputed to be the tomb of Zoroaster, these roses were again encountered.

3. Yunnan, 1997.

Planning this tour, the Ducrots were inspired by the Rix and Phillips book, The Quest for the Rose, but wished also to go further north to the highlands of Zhongdian and touch the territories explored by the American, Joseph Rock. From the capital of Kunming the route to Dali continues to Lijiang,

strewn with hedges of *R. banksiae normalis* with strong, hooked prickles, *R. multiflora, R. sericea, R. longicuspis* with flowers varying from light to cherry pinks and *R. rubus.*

At Lijiang, one of the prettiest towns in China, the hybrid Gigantea, which Rix and Phillips called the "Li Jiang Road Climber" was found in the Black Dragon Park and the hybrid Chinensis mentioned in the inspirational book were found at the Monastery of the 10,000 Camellias, and cuttings of which were obtained at the Lijiang Botanical Garden. The rose was named "Five Yuan" and has since been put into commerce in Italy, where it is extremely healthy, floriferous and justifiably popular.

Further on the road to Zhongdian at 3,300 metres, inhabited by people of Tibetan stock, a strange form of the four-petalled *R. sericea pteracantha* with white and pink petals was noted. Whilst once there, different varieties of roses were observed, including the *R. pteracantha, R. wilmottiae* and the *R. pendulina*.

At the 16th century monastery of Ganden nearby, a large, shrub rose, 3 x 3m., strongly armed and with leaves similar to the Moyesii was spotted. The blooms were semi-double, salmon to dark pink with a slight smell of the Foetida. Mikinori Ogisu, seeing photos, has suggested that it could perhaps have been the *R. prelucens.*

4. Himachal Pradesh, India, 1998.

This time the intent was to survey the pre-Himalayan range of Pir Panjal, and in particular three specific valleys, at an altitude of between 2,000 and 3,500 metres. From Simla, the capital of the state of Himachal Pradesh and the hill station where, during the era of the English Raj, the Viceroy and the Government moved to the pre-Himalayan hills to avoid the Punjab heat, the party proceeded to Sarahan, formerly the summer seat of the Raj of Rampur, where along the edge of the forest *R. pendulina* and a form of *R. moschata* were spied. At Kalpa (2,961asl.) there were clumps of the Alba rose already

found at Shigar. in Pakistan. The road followed the direction of Tibet and Khabo, the only place where the Himalayas may be crossed without negotiating a mountain pass. At Spiti the landscape entirely changed, for the monsoon rains do not cross the Himalayas. Here a mountain desert presented itself, but a mountain desert with roses! Bushes of the *R. webbiana,* as seen on the Karakorum in Pakistan, all along the roadside as far as Tabo, a beautiful Lamaist monastery. Here, once more, the trip was beset with the common problem of roads being damaged and crumbling due to bad weather. Nonetheless a number of cuttings obtained during this trip subsequently rooted and are now flourishing in the Ducrot garden in Italy.

I do hope this short talk about adventurous and courageous rose lovers has inspired you to share their joy and also the privilege of seeing these most beautiful of flowers in their natural setting in the countries of their birth.

Of course, should you be in Italy, a visit to the extraordinary garden and collection of roses of Isabella and Vicky Ducrot in Umbria is an unforgettable event.

I am indebted to Isabella and Vicky, Luciano Arcangeli, Walter Branchi and Mikinori Ogisu for suggestions and advice as well as almost all photographic material.

R. foetida, yellow and red forms

Natural habitats of wild roses in Japan

Dr. Yuki Mikanagi

Japan is a small country, and ca 73 percent of its area is taken up with mountains and hills. Most of the population lives in cities and towns in very limited usable flatlands. When considering the conservation of wild roses in this country, it is necessary to frame appropriate policies, taking into account the varied local habitats, and the relationship between nature and humans living there. This is a report on the present status of our activities to conserve wild roses native to Japan, and on the problems we face there.

1. Natural Habitats of Wild Roses in Japan

(1) Alpine Roses: those in national parks

In Japan there are 31 national parks and 54 quasi-national parks so designated with the aim of preserving the finest natural spectacles for the next generation and beyond. Many of them are known as natural habitats of alpine roses native to Japan. In Fuji-Hakone-Izu National Park, we can find *Rosa nipponensis*, *R. hirtula* and *R. fujisanensis*. Since they are protected by rangers, and visitors fully understand the importance of plants and animals in the park, we don't need to worry so much about the wild roses in national parks.

(2) Roses in Hilly Areas: those growing in commonage or in forests taken care of by humans

Naturally, roses love sunshine, and they cannot live in dark primeval forests. We can find *R. onoei hakonensis* and *R. sambucina* in forestry areas, mainly near woodland paths or streams. Commonage is ideal for the survival of wild roses.

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Since cattle only eat plants without thorns, we do not worry much about their loss. *R. davurica alpestris* is found in commonage in colder regions, and *R. bracteata* is found in commonage in Iriomote-jima, an island in the southern sea. The fate of these roses largely depends on the attitudes of forestry workers and stock farmers in the area.

(3) Roses in Satoyama (woodlands and fields near human habitats): those which sometimes grow near rice paddies

'Satoyama', found in many places in Japan, is a special area known for its rich biodiversity. Roses in Satoyama are those most familiar to us for more than one thousand years. Recently, they face the menace of urban development and introgressive hybridization by our garden roses. The roses shown below all belong to section Synstylae; however, when they suffer introgression, their styles separate like those we see in modern roses.

(4) Roses on Riversides and Seashores

Though riversides and seashores are good habitats full of sunshine, natural disasters such as tsunami and severe flooding sometimes modify their landforms. Roses on riversides and seashores often face, besides the menace of such natural disasters, damage caused by bank protection work. For example, *R. rugosa* used to be distributed widely in northern parts of Japan; however, it is difficult to find many natural colonies now. Not just bank protection work, but attempts to re-vegetate the area with genetically different *R. rugosa* plants obtained from other localities, have totally destroyed the original colony. Pure natural colonies are found only in Hokkaido and a few other islands.

2. Ex-Situ Conservation of Wild Roses in Rose Gardens and Botanical Gardens

Some rose gardens and botanical gardens in Japan, e.g. Hamadera Park Rose Garden, the City of Sakura Rose Garden, Hakone Botanical Garden of Wetlands, and Echigo Hillside

National Park, are all concerned with ex-situ conservation of wild roses. Hamadera Park Rose Garden especially has collected all the wild roses from their wild habitats, preserves them and boasts perfect data of their collection.

3. Problems We Have to Tackle from Now On

To protect our natural habitats of roses, we have to solve the problems below:

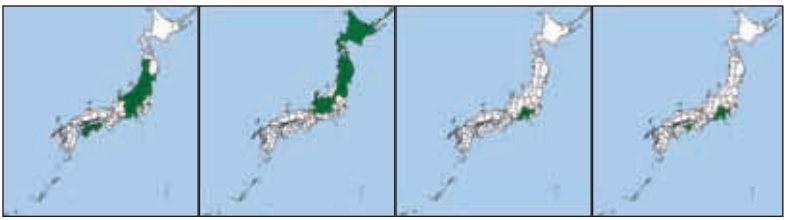
- Coming to terms with large scale public works and urban development
- Controlling genetic pollution (introgression)
- Making a correct identification of species
- Rousing public interest in wild rose conservation

The conservation programme of *R. multiflora* var. *adenochaeta* in the Kuma riverside is a successful example run by an NPO in cooperation with city and town government offices. I hope we will share their experiences, and will see memorable achievements in many other places in the future.

My heart, like the bud of the red, red rose,
Lies fold within fold aflame,
Would the breath of even a myriad Springs
Blow my heart's bud to a rose?

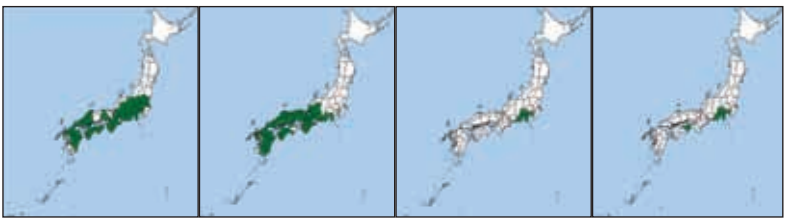
Emperor Babur (1483 -1530)

Rosa multiflora var. adenochaeta in Kumagawa riverside
(photo by Keiji Yamaguchi)

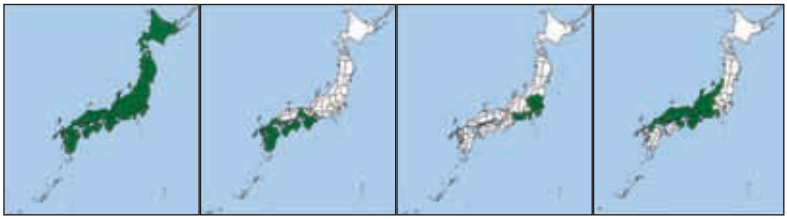


Rosa nipponensis, R. acicularis, R. hirtula, R. fujisanensis

Rosa hirtula in Mt. Ashitaka (photo by Yuki Mikanagi)

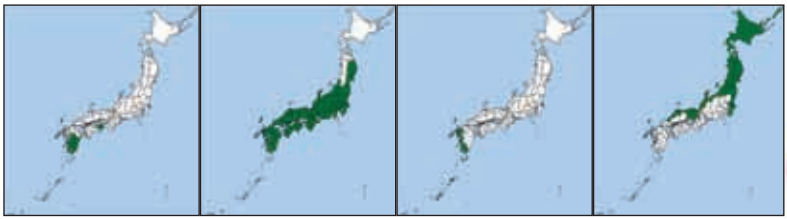


R. onoei, R. hakonensis, R. sambucina, R. davurica var. alpestris, R. bracteata



R. multiflora, R. onoei, R. onoei var. oligantha, R. paniculigera

R. multiflora *R. onoei* *R. onoei var. oligantha* *R. paniculigera*



R. multiflora adenochaeta, R. luciae, R. luciae f. grandulifera, R. rugosa

Rosa rugosa in seashore of Notsuke in Hokkaido (photo by Makoto Hiraoka)

Roses in Singapore

Tuan Ching

Singapore is one of the more challenging places in the world to grow roses. It has an extreme tropical climate with high daily temperature (31° C. average), high humidity (83% average), high rainfall (rainstorms almost every other afternoon, 6.7" monthly average, with up to 12" in December), and a scarcity of land which means that more than 90% of the population live in high-rise apartments. Rose plants do survive in Singapore, but they seldom grow or bloom to their full potential without the appropriate growing techniques or microclimates. Flowers are usually fewer in number, lower in petal count, smaller in size-opening flat in a matter of hours, and their scent dissipated by late morning. For example, the average size of a bloom of the Bourbon, 'Souvenir de la Malmaison', is 1.5" compared to the 4" that is easily attained in cooler climates.

Singapore prides itself as a garden city. For decades, the greening of the city has been a priority. The local orchid industry is world class. In 2012, a huge billion dollar project called Gardens by the Bay, with two climate-controlled glasshouses situated at the southern coast of the island, was completed. The larger structure, the 1.2 hectare Flower Dome, is the world's largest free-standing greenhouse and contains, among many other temperate species, a collection of potted, grafted roses imported from Australia and the UK, at great expense. Grown at a constant dry temperature of about 24° C., these modern hybrid teas, floribundas and David Austins etc. provide the experience of seeing roses flourish as they would in a temperate climate. Unfortunately, to maintain a steady procession of blooms, the potted plants are discarded and replaced regularly.

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The cultivation of roses in public urban green spaces is not practiced, though there have been trial plantings of Hybrid Teas conducted at the Botanic Gardens in the late 1980's. Though they bloomed well, they were grown under green netting and did not last long. These days, any headway in local rose cultivation is usually led by advanced amateur growers, horticultural tradesmen and collectors who have the patience and the passion to tend to their roses' specific needs.

The gardening enthusiast in Singapore has at hand a plethora of tropical stalwarts, such as bougainvillea, plumeria, aroids, orchids and heliconias. Planting roses has long been considered by local cynics to be in the same order of folly as, say, growing strawberries (which incidentally has been done, but with herculean effort). But because of its beauty, scent and romantic associations, many Singaporeans grow roses despite the odds-even if it means buying plants in flower and discarding them after the blooms fade (as they would a Christmas poinsettia), or after a few months, when the plants succumb due to neglect or ignorance. Potted rose plants are imported from Holland (usually florist-grade miniatures), but most of them are trucked in from Thailand and Malaysia, the many lowland regions of which have climate conditions identical to that of Singapore's. Roses that originate from the cooler highlands tend to be more lush, but they require a vital period of acclimatization to survive in the heat, without which would mean a rapid decline and certain death.

Singapore's mass urbanization began in the 1950's, at a time when most people lived in houses or huts in villages with garden areas. Up till the early 1990's, it was not uncommon to see huge mature specimens of the local old garden rose covered in bloom. Commonly known as the *Kampong,* or Village, rose, it is identical to the "found" Bourbon in the USA nicknamed 'Maggie', (suspected to be 'Eugène E. Marlitt' bred by Rudolf Geschwind in 1900), and the splitting image of 'Zi Yan Fei Wu', an old classic Chinese OGR. Another naturalized rose is a pink OGR very similar to

'Rose Edouard', the Bourbon widely cultivated in India. What's special about these *Kampong* roses is that they thrive with minimal care under the searing hot sun, and when well tended, their flowers are large, highly fragrant, and plentiful. Unfortunately these old roses are quite rare nowadays as farms and villages have been razed, and also because they are seldom found in commerce-given the usual preference for modern roses with classic Hybrid Tea forms or brightly colored, massed blooms. Occasionally, one might come across large bushes of Hybrid Teas and Chinas along suburban roads, usually abandoned plantings that have survived by chance.

Hybrid Teas and Chinas are the classes of roses most commonly grown in Singapore. Climbers and Ramblers rarely flower well, since most of their growth goes into really long stems and lush leaves. I once had the large flowered climber 'Sombreuil' grow to 16 feet tall (not grafted), which produced only two dozen blooms in four years (I discarded it and planted a bougainvillea in its place). The once-blooming OGRs such as the Gallicas, Albas,Centifolias etc. are even less likely to flower for the want of a crucial winter-dormancy period. OGRs that have fuller blossoms or thin petals are prone to balling in the rain and high humidity.

In recent years, named, grafted modern hybrids, such as Hybrid Teas and popular David Austin-type "modern reproductions" have begun to appear in Singapore. Grafted roses typically possess greater vigour and have larger flowers, though the plants usually dwindle in about five or six years due to the unrelenting heat-presumably because the commonly used Dr Huey or Multiflora understocks require a period of cool weather rest for longevity. Roses grafted on *R. Fortuniana* are also becoming available, and the hope is that these will thrive in Singapore's weather as successfully as the *R. Fortuniana*-grafted roses that flourish in the hot southern regions of the USA.

In Singapore, the majority of roses are grown in pots in apartment buildings, in balconies and corridors. Though this may restrict the number of plants that can be grown, the limited amount of direct sunlight may be a blessing in disguise as a full day's exposure may be too brutal for potted specimens, and strong torrential rains will ruin a perfect bloom in no time. It is not surprising to see roses in high-rises out-perform roses grown in the open ground. Locations that allow about five hours of direct sun each day are ideal. Furthermore, insect damage and diseases spread by splashing or via airborne vectors are less apt to occur on high apartment floors.

To grow roses well in the heat and high rainfall, there are a few cultural details that are crucial-porous, fast-draining potting media, adequate fertilizing, and judicious pruning.

Planting media: Western potting mixes that are high in humus, such as peat or compost, will not work in the long-term, as humus material breaks down rapidly in the tropical heat. In a few months a rose plant potted with excessive humus will suffer from root rot when the mix turns sticky and foul-especially when exposed to rain. Local garden soil is commonly a silty yellow/pink clay and not ideal for pot culture as it compacts easily and becomes a hard mass if allowed to dry out. The most popular local potting medium is burnt earth, easily found in garden centers, imported from neighboring countries such as Indonesia. It is basically clay clods burnt in large bonfires. The clay hardens into solid, fast draining granules of a red terra-cotta color, good enough to use on its own without any additives-practically a "soiless" medium if well fired and sieved to consistent size. Nurseries often stretch the mix by adding coarse pulverized coconut coir (cocopeat) and charcoal chips, which are well-draining organic materials that do not disintegrate easily.

Watering and feeding Roses are exhausted easily in the heat, and a regular schedule of watering with a nutrient rich

mix enables strong sustained growth and flowering. Small doses of fertilizer in the daily watering work better than if the proportionally correct doses were applied at weekly or bi weekly intervals. Soil amendments such as Epsom salt, phosphate and bone meal are also important.

Pruning: Young own-root rose plants grow slowly in the heat. Even with great care, it takes a year or two for them to establish and begin to throw out strong basal sprouts that will eventually form the framework of the mature plant. Aside from deadheading and disbudding (the removal of flower buds on young or weak plants, or when the weather is brutally hot), nothing should be pruned unless diseased, broken or growing way out of bounds (even then not too much should be taken off). Potted plants should have roots trimmed every two or three years (trimming off about 1/2" of the root ball surface would suffice for root bound plants) as the stress of being root bound is worse than having a slightly smaller root ball in active growth. The potting mix can also be refreshed at that point. Except for old, overgrown, once-vigorous specimens, hard pruning for rejuvenation and other "western" methods for pruning roses that go through winter dormancy must be avoided!

So what is in the future for rose gardening in Singapore? With a healthy market for potted roses, it behoves local nurserymen to curate their rose offerings to consist more of grafted, proven varieties that do well in Singapore's climate-varieties such as 'Red Eden', 'Moonstone', 'Don Juan', 'Mr. Lincoln', 'Fair Bianca', 'Pope John Paul II', to name a few. Thai growers are looking into Indian hybrids, which is a promising development. Classic old "village" roses can be reintroduced and made more available, and holding experimental trials for varieties that do well in other hot climates may be a great way to discover new, Singapore-worthy roses.

1. Hybrid Tea Ingrid Bergman and other potted roses along a typical apartment corridor

2. Pink "village" OGR that thrives in the heat, similar to the Bourbon Rose Edouard, commonly called the "Damask," due to its strong scent

3. A grafted Pope John Paul II, flowering profusely, perched on a balcony

4. Large blooms of David Austin's William Shakespeare from a mature grafted plant, bleached and fried by the noonday sun (photos courtesy of KH Lee, Linus Loh and Gabriel Tee)

Tulips, Traders and Roses

Behcet Ciragan

Tulips

The story of the introduction of the tulip to Western Europe by Ogier Ghislain de Busbecq, who was the ambassador of the Holy Roman emperor at the Ottoman court during 1554-1562 is well known. Back in Vienna, he met Carolus Clusius in 1573 whom he gave tulip seeds, bulbs and other rare plants such as the *Fritillaria imperialis* . Clusius started disseminating bulbs in Europe, moved to Frankfurt in 1587 and finally to Leiden in 1593 where he established the botanical garden of the university, based on his valuable collection.[1] The theft of his bulbs in 1596 and 1598 resulted in a wide distribution of tulips around the so-called United Provinces, peaking in the Tulipomania of 1636/37.

At the end of the XVIth century, the tulip, though still very rare, had been in European gardens already for some time. The Swiss botanist Conrad Gesner sketched the first tulip in 1559 in the garden of Johann Heinrich Herwart, a councilor of Augsburg in Bavaria[2], who imported them in 1557 from Istanbul. In 1562, they arrived in Antwerp, directly from Istanbul; they were found in Bologna and Florence. "Many of the influential and affluent citizens of Europe planted their own gardens and wanted to stock them with rare and coveted plants. Even in Augsburg, Councilor Herwart's collection was easily overshadowed by the gardens of the Fuggers, the fabulously rich Bavarian family of bankers.[3] The Fuggers had 1565 tulips in their gardens.[4]

While these highly-valued flowers were sourced from Istanbul, their origin was much more frugal and thousands of miles away – unknown at the time. It is assumed now that

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there are about 120 species of tulips, of which three quarters have originated in Central Asia.[5] "Taxonomists believe that the first tulips sprang from the scrubby slopes of the Pamirs and flourished among the foothills and valleys of the Tien Shan Mountains, where China and Tibet meet Russia and Afghanistan in one of the least hospitable environments on earth. …The flowers of the Tien Shan were much shorter than modern tulips, carrying their petals usually a scant few inches from the ground. However, they were hardy and well adapted to survive the harsh winters and parched summers of central Asia".[6]

The region between the Altai, Tien Shan and Pamir ranges is the original homeland of the nomadic Turkish people, who in mid VIth century established their first Köktürk Empire, flooding west to the Caspian Sea and east into China. "As pastoralists, the Turks would have encountered the tulip where it grew wild in the valleys of Tien Shan; as invaders, they would also have found colonies growing at much higher altitudes as they crossed the passes leading south, for the tulip can flourish in very mountainous terrain and even in winter under a blanket of snow. The simple beauty of these unsophisticated wildflowers, with their petals colored yellow or orange or cinnabar, must have been considerably enhanced by the bleak surroundings in which they were usually encountered, and that would have made them attractive. But for nomads who had survived another howling, freezing Asian winter, the year's first tulips were more than just oases of beauty appearing in the wilderness. They represented life and fertility. They were the heralds of spring."[7]

One has to imagine the Köktürk Empire as a confederation of clans, of Turkic and other nationalities, led by a noble family. Following nomadic tradition, the Empire was immediately divided into a Western and an Eastern part. While the East was subjugated by the Tang Dynasty in 630, the West fought against the Sassanids and Arabs, exchanged ambassadors with Byzantium, profiting from the control of the Silk Road. It

finally succumbed mid VIIIth century to internecine fighting and was superseded by the Uighur state, again a confederation of various tribes of Uighurs, Karluks and Oghus Turks.

From then onwards, the history of the Turkish people is a series of state formations, based on the warlike prowess of nomadic clans. One center of gravity moved hereby from Central Asia to the West, into the Sogdiana Basin, northern Iran, Caucasus, Middle East, Anatolia, North Africa and Balkans – with the states of the Karahanids, Seljuks, Aq Qoyunlus, Qara Qoyunlus, Mameluks, Ottomans being the most important – with the Afsharid and Qajar dynasties ruling Iran for two centuries; another stream went over the Caspian and the Black Sea, with the Khazars, Pecheneks, Volga Bulgars, Tatars; while a further prong entered Afghanistan and India.

This historic excursion may be of no interest to us until we visualize that the ruling families based their power and were accompanied by warriors coming from thousands of nomadic families moving along with them from pasture to pasture, with their horses, camels, sheep, tents, rugs, children, houseware – a tradition still existing in modern southern Turkey with the so-called Yörüks, descendants of the thousands of nomads who streamed into Byzantine Anatolia in the 11th century, as well as the Bakhtiari and Qashqa'i nomads tribes, who have their high-altitude summer pastures west of Isfahan and in the foothills of the Zagros mountains south and west of Shiraz in Iran.[8] While it is men who select the camp site, it is the women who unload the animals and set up the tents for the stay of many months. Is it therefore a coincidence that we find tulip species all along these migration routes, from Central Asia through northern Iran to the Zagros Mountains, eastern and southern Turkey, Black Sea coast, Caucasus, southern Ukraine, Crimea? *T. schrenkii* Regl. is found in Crimea, in the lower reaches of the Don, Caucasus and Kurdistan[9]; *T. clusiana* DC in Kashmir, eastern Afghanistan, northern Iran, but also in Turkey, Balkans[10] ; *T. biflora* Pallas in eastern Turkey, southern Russia, Caspian region, Iran, Irak. I propose that nomadic

women carried memories of the beauty of their homeland steppes in the form of bulbs on their way to the unknown western destinations.

The migration routes predate Turkish expansion, but Hunnic, Cimmerian or Scythians women might have had similar memories. In the case of the Seljuk Turks, we have, however, evidence of the tulip's introduction in Iranian poetry of the 13th century, when Sa'adi describes in his Gulistân (1258) an "ideal garden where "…the murmur of a cool stream, bird song, ripe fruit in plenty, bright multi-colored tulips and fragrant roses" combined to create an earthly paradise".[11] "The earliest known drawings of tulips are found on tiles excavated from the thirteenth-century palace that one of their sultans, Alaeddin Kaikubad I, built on Lake Beysehir" [near Konya in central Anatolia].[12]

In the XVIth century, the Ottoman Turks' passion for flowers, and the remarkable skill with which they tended them, were among the novelties that drew comment [of Westerners]; even the cultivation of plants purely for their beauty seemed strange to visitors accustomed to think of them as things to eat or pound into primitive herbal medicines".[13] Busbecq wrote in his letters, "The tulip has little or no scent, but it is admired for its beauty and the variety of its colors. The Turks are very fond of flowers, and though they are otherwise anything but extravagant, they do not hesitate to pay several aspres for a fine blossom".[14] After Mehmed II conquered Constantinople in 1453, one of his first acts was to start building the Topkapi palace surrounded by "very vast and very beautiful gardens, in which grew every imaginable kind of plants and fruits; where water, fresh, clear and drinkable, flowed in abundance on every side, and flocks of birds, both of the edible and of the singing variety, chattered and warbled".[15] "Ottoman gardens were impressionist spectaculars in comparison [to the formal gardens of western courts], planted not to impress the eye with geometrical precision but to seduce it with visions of lushness and plenty….intended as a little piece of heaven on

earth.[16] The pavilions in these gardens emulated the tents of the nomadic forebears, as if one only had to take a step to be in the flowering steppe.[17]

The Turkish love of flowers was fortuitously amalgamated with the much older Persian garden tradition they encountered when they moved into Sogdiana in the VIIth and into Iran itself in the Xth centuries. Walled gardens with a central water channel and side channels leading perpendicularly from it – the so-called quadripartite *chãhãr bãgh* (four gardens) concept – has been excavated among the ruins of Pasargade, built by Cyrus the Great 2500 years ago.[18] "The Spartan General Lysander, who joined Cyrus the Younger as a Greek mercenary in 401 BC, reported to Xenophon how the Persian kings excelled not only in war but also in gardening, creating *paradeisos* (paradises) where they collected plants, especially trees which bore fruit, and animals encountered during campaigns in foreign parts. Xenophon translated the Persian *pairidaeza* (a combination of *pairi* meaning "around" and *daeza* meaning "wall") into the Greek *paradeisos*, a term used for the Garden of Eden in Greek translations of the Bible".[19] Penelope Hobhouse also mentions that this garden was in Sardis in western Turkey and shown to Lysander by Cyrus himself. Lysander "marveled how the paradise was laid out with fruit trees in formal rows: 'the beauty of the trees all planted at regular intervals …in perfect regularity – the rectangular symmetry of the whole and the many thousand scents of sweet flowers which hung about them'".[20] "The garden with running water and the cool shade of trees provides a refuge from the dust and heat of the surrounding desert and is constantly likened to a paradise on earth in Persian literature".[21]

Following the Arab conquest of the Sassanid Empire in 642-651, the walled *chãhãr bãgh* concept was integrated into the new Islamic architecture and carried with the Arab expansion to North Africa, Sicily and the Spanish peninsula in the VIIth/VIIIth centuries. "..the Muslims built on the basic fourfold format of the Sassanid paradise garden to develop

the Islamic garden according to Koranic teaching as a sensual experience, a terrestrial paradise, a foretaste of heaven for those who followed the word of the Prophet. To the nomad's dream of cool shade, running water, fruit and scent inside protective walls was added a new symbolism that enhanced the garden as a private place for contemplation where man could try to find an equilibrium between himself and God, temporarily removed from the human worries and turmoils of the outer world".[22]

''The concept of the Persian garden, like other Iranian traditions, was adopted by the descendants of the Mongols, the Il-khãnid rulers, in the late 13th and 14th centuries and continued by their descendants. Ruy Gonzáles de Clavijo, who was sent by Henry III, King of Castile and Leon, as ambassador to Timur in 1404 "tells of great palaces near Samarkand with surrounding gardens and orchards in which Timur held parties on successive days – 'and so numerous are these gardens and vineyards surrounding Samarkand that a traveler who approaches the city sees only a great mountainous height of trees and the houses embowered among them remain invisible'. Illustrated manuscripts of the Zafarnãma (Book of Victory), a history of Timur originally written not many years after his death in 1405, usually include a miniature of his celebrations held at Kãn-i-Gil outside Samarkand often showing Timur enthroned in a splendid tent surrounded by his retinue Timur's appreciation of flowers [is shown by] him holding one whilst a spray of blossom is fastened to the aigrette in his turban".[23]

Timur takes us back to the third strand of Turkish expansion – towards the South: The Ghaznavids captured today's territories of Afghanistan, Punjab and Baluchistan in the Xth century; Qutb-ud-din Aybak established the Delhi Sultanate in 1206. His Mamluk dynasty, followed by the Turkic Khilji, Tughlaq and Sayyid dynasties ruled northern India until 1451. Timur, of the Turkified Mongolian Barlas tribe, established his own empire in the second half of the XIVth century, reducing his Dchingisid Chagatai overlords to puppets. The Timurid Empire extended from Anatolia to

Central Asia and today's Afghanistan and Pakistan. The Qutb Shahis ruled the Sultanate of Golconda in the XVI/XVIIth centuries and Mir Qamar-ud-din Khan (Nizam-ul Mulk) established the Asaf Jahi dynasty in Hyderabad in 1724.

The most significant impact, both historically and in gardening terms, was however, by the Mughal Empire founded 1526 by Zahir ud-din Muhammed Babur, a great-great-great grandson of Timur. The Mughals called themselves the House of Timur and the royal family spoke Chagatay Turkish as well as Persian at home.[24] Babur died early in 1530, but left us his Memoirs, the "Babur-name", written in Chaghatay Turkish, in an open, frank style.[25]

"The genesis of the Chagatayid Turco-Mongolians lay with Genghis Khan's second son, Chaghatay who inherited the Issyk-Kul region, the basin of the Ili River southeast of Lake Balkhash, and the eastern portion of the steppes of the Chu and Talas rivers, with Kashgar and Transoxiana as dependencies The various peoples in this vast territory, the middle part of Genghis Khan's empire, constituted the ulus (nation) of Chaghatay. Unlike their kinsmen to the east, the house of Kublai in China, and to the west, the house of Hülagü in Persia, the Chaghatayids did not assimilate to the ruling traditions of ancient empires, for the territory in which they found themselves really had no established legacy of urban administration. While the rulers of the Yuan dynasty (1279-1368) became Sons of Heaven in the Chinese mold, and the Ilkhanids became sultans in the Iranian fashion, the khans of the Ulus Chaghatay became Turks, the peoples among whom they dwelt."[26]

In Babur-nama, Babur describes a multitude of flora and fauna in Central Asia and in India, mostly based on his own observations. His interest for plants and animals is based on the one hand on his love for nature, on the other due to his education in fine arts, which was influenced by his mother Qutlug-nigâr Hanim, his grandmothers Isãn-dawlat Begim and Sultan Begim, as well as his older sister Han-zâda Begim.[27] An important factor in Babur's life was gardening culture. "By appropriating lands outside the fortresses of the

pre-Mughal rulers whom he had defeated, he demonstrated …his unassailable territorial power. As settings for dazzling receptions, in which a strict code allowed both public and private access to the royal presence, the imperial gardens he established – camp-like enclosures in Timurid style – became more potent as symbols of royal power and prestige than as representations of the Koranic Paradise. Babur encouraged his nobles to lay out gardens along the Jumna River in Agra, creating a suburb of gardens much like those in Samarkand and Herat. In both Agra and Delhi, waterfront gardens became a feature, with their main buildings set on the riverbank, where they could receive cooling breezes and be seen by passing boats, rather than in the center or cross-axis of the garden".[28] He writes:

"I always thought one of the chief faults of Hindustan was that there was no running water. Everywhere that was habitable it should be possible to construct waterwheels, create running water, and make planned, geometric spaces. A few days after coming to Agra, I crossed the Jumna with this plan in mind and scouted around for places to build gardens, but everywhere I looked was so unpleasant and desolate that I crossed back in disgust. Because the place was so ugly and disagreeable I abandoned my dream of making a charbagh.

*Although there was no really suitable place near Agra, there was nothing to do but work with the space we had. The foundation was the large well from which the water for the bathhouse came. Next, the patch of ground with tamarind trees and octagonal pond became the great pool and courtyard. Then came the pool in front of the stone building and the hall. After that came the private garden and its outbuildings, and after that the bathhouse. Thus, in unpleasant and inharmonious India, marvelously regular and geometric gardens were introduced. In every corner were beautiful plots, and in every plot were regularly laid out arrangements of [*gul *and* nastaran*]"*.[29]

Thackeray translates *gul* as roses and *nastaran* as narcissus. However, narcissus is *nargis* for Babur.[30] Ingeborg Hauenschild equates *nastaran* with "the white Rose of India, *Rosa glandulifera*" and she continues to state that under gul we

need understand the purple-red Bengal rose, *Rosa chinensis* and under *nastaran* the White Rose of India, never the Narcissus as Beveridge and Thackeray translate. Narcissi are not suitable for a continuous planting of beds as they bloom only shortly and then pull back under the soil. The double, very fragrant blooms of the White Rose of India, on the other hand, bloom all the year round.[31]

R. glandulifera Roxb. is a synonym of *R. moschata plena*. We know the term *Nastarana* (or Pissardii or *R. godefroyae* Carr.] now as a rose which was discovered by Ernest François Pissard in 1879 when he was the gardener of the Shah of Persia.[32]

Babur has other mentions of roses:

"The Andizhan River passes through the area around Osh [in the Fergana valley] and goes on to Andizhan. On both its banks are gardens, all of which overlook the river. The violets [banafša] are beautiful, there is running water, and in the spring, when many tulips [lãla] and roses [gul] bloom, it is quite nice".[33]

"There are some marvelous flowers in Hindustan. One is the hibiscus [jâsũn], which some Hindustanis call gudhal. It is not a shrub but a tree with stems. It is somewhat taller than the red rose [qïzïl gul], and its color is deeper than the pomegranate [anãr] flower. It is as large as a red rose. The red rose blossoms all at once after budding, but when the hibiscus blossoms, from the middle of the petals yet another slender stalk is formed, as long as a finger, from which still more hibiscus petals open. The result is a double, amazing flower".[34]

"Another flower is the oleander [kaner], which occurs in both white and red….The bush is larger than the red rose".[35]

Ingeborg Hauenschild states that under *qïzïl gul* we probably have to understand the double Bengal rose, *Rosa chinensis*, a short, well-branched rose with purple-red blooms of long duration.[36]

Babur sang the red rose in a poem (Ghazal).[37]

My heart is fold by fold in blood like a rosebud

Even if there were a hundred thousand springs, what possibility would be there of its opening?

In Chagatay:

Mening könglüm ki ġulning gunčasï dek tah ba tah qan dur

Agar yüz ming bahār olsa ačïlmaqï ne imkān dur?

And in modern Turkish:

Benim gönlüm gülün koncası gibi kat be kat kandır

Eğer yüz bin bahar olsa açılmasına ne imkān vardır?

This chapter started with tulips and is closed with Babur's observations on tulips:

"Tulips of many varieties cover the foothills [of the Gulbahar hills in the Baran river valley]. Once, when I had them counted, there turned out to be thirty-two or thirty-three unique varieties. One sort, which gives off a bit of the scent of red roses, for which reason it is called a gulboy [rose scent] tulip, is found in Dasht-I Shaykh and nowhere else. In these same foothills, below Parwan, in a patch of ground at the mouth of the Ghorband defile, the centifoil tulip [şadbarg lāla] grows".[38]

Ingeborg Hauenschild remarks that although *şadbarg lāla*, the expression chosen by Babur seems quite imaginative, as a wild tulip always has six petals, the habitus corresponds to that of *Tulipa orthopoda* Vvedenskii, an endemic variety which is about 8 cm tall. Its stalks do not end as usual in a single bloom, but in a bouquet of flowers of up to seven white crowns with yellow bases.[39] On the other hand, the tulip is capable of surprising variation, as reports of a *Tulipa lutea centifolia* in 1665 and other doubles[40], sports and atavism show.[41]

Traders

The most well-known trade route between the East and the West, the Silk Road, is the subject of a separate presentation here by Robert Mattock. I will therefore concentrate on maritime trade between China, India and the Near East and

the Mediterranean area. This did not come into being with the Portuguese "discovery" of the India route at the end of the XVth century, but is many thousands of years old.

"Sumerian and Akkadian inscriptions of the third millennium B.C. report of maritime relations between Mesopotamia and the countries of Dilmun, Magan and Melukhkha. Dilmun is probably the island of al-Bahrayn. Magan is now generally agreed to be 'Ūman".[42] "Melukhkha must refer to the area of the Indus Valley civilization, that is, Sind, the Punjab, Gujarat and parts of the adjacent provinces".[43] "There is sufficient archaeological evidence for the trade between Mesopotamia and the Indus valley. Impressions of clay seals from the Indus Valley city of Harappa were evidently used to seal bundles of merchandise, as clay seal impressions with cord or sack marks on the reverse side testify. A number of these Indus valley seals have been found at Ur and other Mesopotomian sites. The Persian-Gulf style of circular stamped rather than rolled seals, also known from Dilmun, that appear at Lothal in Gujarat, India, and Failaka Island (Kuwait), as well as in Mesopotamia, are convincing corroboration of the long-distance sea trade".[44]

Evidence of the maritime trade in subsequent centuries is scarce. "Darius the Great (521-485) appreciated the value of linking Persia with India and Egypt by sea as well as by land….He sent a fleet down the Indus and thence round Arabia to Egypt".[45] Alexander the Great's land expedition into Sogdiana and the Indus valley is well known. In his last year had been "busy hiring Phoenicians to navigate the Persian Gulf and colonize its shores; transporting many vessels in parts from Phoenicia to Mesopotamia, and constructing a few from cypress trees near Babylon….and sending out three ships for preliminary exploration down the Gulf".[46] With the capture of Mesopotamia by the Parthians between 140 and 130 BC, the "Parthian emperors could draw a fine revenue from the land routes across their realm to India and China, and gave no facilities to Western enterprise, Greek or Roman,

to establish a rival sea route".[47] With the establishment of the Pax Romana in the Mediterranean basin by Augustus, trade between Rome and India achieved again important dimensions. "*Strabo reports that…no fewer than 120 ships were now sailing in a single year from Myus Hormus to India…Large numbers of Roman coins have been found in India, and the existence of a temple of Augustus at Muziris [around Kodungallur] in Malabar is evidence of a fair number of Greek and Roman merchants residing there…The western terminus for this traffic was Alexandria….Pliny allows forty days from Ocelis [on the straits of Bāb-el Mandab] to Muziris… if the destination was Barygaza (Broach) or any port of Northwest India, they coasted as far as Cape Syagrus before crossing the ocean. Another route was to keep to the African shore as far as the Cape of Spices, and perhaps call at Socotra before setting a course for India. In Northern India cargoes of silk, cotton, and other fine clothes were loaded; in the South, jewels and pepper*".[48] "In the Indus delta, Roman merchants frequented Barbarikon [near Karachi], where they off-loaded manufactured goods such as silver plate, glass vessels, and wine, and took on commodities and products from distant regions that included Afghanistan (lapislazuli) and China (silk)".[49]

By the first century AD, the shipping routes across the Indian Ocean had already been well established. An unknown Greek merchant of Alexandria compiled ca 60 AD the *Periplus Maris Erythraei* , a "handbook of the coasts of the Indian Ocean for the use of merchants and pilots. The detailed account of the sailing conditions, ports and products of the Red Sea coasts, Somaliland, and Western India show that the writer had personal experience of those regions".[50] The *Periplus* describes the goods exchanged in Barygaza as:

"*There are imported into this market-town (Barigaza), wine, Italian preferred, also Laodicean and Arabian; copper, tin, and lead; coral and topaz; thin clothing and inferior sorts of all kinds; bright-colored girdles a cubit wide; storax, sweet clover, flint glass, realgar, antimony, gold and silver coin, on which there is a profit when exchanged for the money of the country; and ointment, but not very*

costly and not much. And for the King there are brought into those places very costly vessels of silver, singing boys, beautiful maidens for the harem, fine wines, thin clothing of the finest weaves, and the choicest ointments. There are exported from these places spikenard, costus, bdellium, ivory, agate and carnelian, lycium, cotton cloth of all kinds, silk cloth, mallow cloth, yarn, long pepper and such other things as are brought here from the various market-towns.[51]

An important information in the *Periplus* is that ships were shortening the voyage to India by using the southwest monsoon of summer for the outward voyage to India, in addition to coasting along the Arabian shores of Oman and using the northeast monsoon.[52]

Maritime trade also existed with China, though evidence is from later centuries: "*Sung-shu, ch 97 (covering AD 420 -478) certainly shows Chinese shipping as far west as India…'As regards T a-ts'in [Syria] and T'ien-chu [India], far out on the western ocean… although the envoys of the two Han dynasties have experienced the special difficulties of this route, yet traffic in merchandise has been effected, and goods have been sent out to the foreign tribes….All the precious things of land and water come from there, as well as gems made of rhinoceros horns and chrysoprase, serpent pearls and asbestos cloth'"*.[53] *"Fa-Hsien's account of his return journey from India to China by sea during AD 411-13 is a good example of the sea voyages between the two regions. He boarded a Chinese vessel from Tamralipti on the Bengal coast and proceeded to Sri Lanka, from where he went on to China….I-Tsing (635-713) took the sea route to reach India via Srivija and Kedah. The same route was taken by him to reach back T'ang China after 25 years of travel. This was a time when long distance trade circuits between Abbasid Persia (750-1258) and T'ang China (618-907) had incorporated several ports and regional economies of maritime India into their orbits. The long distance commodity movements from al-Basrah or Muscat or Sohar in Oman in the Persian Gulf and terminating in Canton in China had several halting centres or feeding units including Koulam Mali (Quilon) along the coastal fringes of India"*.[54]

There are many records of Persian shipping to China from soon after the Arab conquest in the VIIth century onwards. In 1998, the sunken Persian merchant ship "Batu Hitam" was discovered off the Indonesian coast, loaded with 67'000 pieces of Chinese ceramics.[55] By the mid of the IXth century regular sailing to China took place. "The western termini for the China ships were al-Başrah and al-Ubullah and Sīrāf…. *Akhbar* [*Akhbār al-Şīn w-al-Hind*, ca. 851] reports that cargoes were generally brought in smaller vessels from al-Başrah and other ports of the Gulf to Sīrāf and there transferred to the large China boats. Exports to the Far East probably consisted of costly fabrics of linen, cotton or wool, including rugs; metal-work, iron-ore and bullion".[56]

"The China ships would sail down the Persian Gulf before it gets all rough, in September or October. They would cross from Masqaṭ to Malabar with the northeast monsoon, just as they do today. This was a month's voyage, and we may put it in November-December…The last two weeks of December could be spent trading at Kũlam Malī [Quilon on the Malabar coast], for in any case no further progress could be made until the cyclones in the southern part of the Bay of Bengal came to an end, toward the close of December. A month of sailing to Kalah Bār [Kedah] would cover January. After a few weeks at Kalah, toward the end of the northeast monsoon, a ship may have a following wind through the Malacca strait, and be in time to use the southern monsoon in the Sea of China. This is the summer monsoon, and in that sea it is gentler than the northeast of winter; in April and may it is light, and typhoons are of least frequency then. After a summer in Canton, one would return with the northeast monsoon to Malacca Strait between October and December, and again cross the Bay of Bengal in January, from Kũlam to Raysũt in February or March, still with the northeast. But from Raysũ one might well attain Masqaṭ with the first gentle breeze of the southwest in April, and end the voyage once more in a smooth summer Gulf. Thus the round trip took a year and a half, leaving a summer at home before the next trip".[57]

We can compare this duration with the arduous travel on the Silk Road, where one year had to be calculated for a single 7000km journey from Xi'an to Antiochia on the Mediterranean. In practice, almost no one made the complete journey on the Silk Road. Usually the merchandise was handed over to other traders in certain market locations, who then had them shipped further.[58]

The "Persian" traders were more often than not Nestorian Christians, whose merchants and monks moved to Central Asia, India and China from the times of the Sassanid king Shahpur II (310-379). "The earliest evidence of such migration to Kerala is traceable in the case of the seventy-two mercantile families who came from West Asia under the leadership of Thomas of Cana and settled down in Cornelur (Cranganore) about AD 345".[59] Nestorians entered China by 578. The "St. Thomas Christians" established many settlements along the Malabar coast and Sri Lanka, cultivating land for spice production and trading.[60] The later migration of Christian merchant leaders Mar Sapor and Mar Prodth to Quilon in 823, resulted in a significant upswing of trade activities in the region.[61]

The direct trade from the Near East to China "came to a violent end in 878 when the forces of the rebel Huang Ch'ao besieged and sacked Canton, massacring… enormous number of foreign traders…beside many Chinese".[62] The downfall of the Tang dynasty in 907 and the erosion of Abbasid power in the Near East affected the volume of trade, but "when the direct voyages to Canton ceased, Arabs and Chinese used to meet in Kalah on the west coast of the Malaccan peninsula…. Arabs were also sailing to Sumatra and Java in the tenth century"[63], introducing Islam to the Indonesian archipelago.

The Xth and XIth centuries saw a displacement of the main trade routes. Cairo, the capital of the new Fatimid caliphate replaced Baghdad as a focal point on the western end. Jewish traders from Alexandria and Cairo started to play an increasing role in the trade with India and China.[64]

"An interesting passage of ibn-Khurdādhbih describes the routes followed by Jewish merchants between France and the Far East in the ninth century. One was by sea to Antioch, across Northern Syria to the Euphrates, down the rivers to al-Ubullah, and then by sea….Another route was to land in Egypt at al-Faramā (ancient Pelusium), cross the isthmus of Suez with pack of animals, sail from al-Qulzum to al-Jārand Juddah, then on to India and China".[65] Arab trade with East Africa intensified, with Arab colonization of the coast down to Sofala in Mozambique and to Madagascar being completed. Already in 690 "Umanis emigrated to East Africa in flight from al-Hajjāj, and Persians of Shīrāz and Sīrāf emigrated in the ninth and tenth centuries….Sumatrans migrated to Madagascar in the early centuries of the Christian era and again in the tenth century".[66] By the Xth century, the expansion of Islam from the Arabian peninsula to North Africa and Spain, down the whole coast of East Africa, into Iran, Central Asia and the Indus Valley, as well as to Sumatra had created a cultural "commonwealth" which simplified travelling and trading in this huge expanse. Islamic geographers and travel writers such as Al-Mas'ūdi (896 – 956), Buzurg ibn Shahriyār and the unknown compiler of *Akhbār al-Şīn w-al-Hind* left rich descriptions of the region, preceding the most famous of all, Ibn Baṭṭūtah (1304-1377), who in 1325 left Tanger, his birthplace on a pilgrimage to Mecca and travelled down the East African coast, to Persia, Central Asia, India, Sumatra and China. The world map of the Khalif al-Mamun (786-833) and the maps of al-Idrisi (1100-1165), who in 1138 joined the court of Roger II, the Norman king of Sicily, show the high standard of cartography attained by Islamic savants.[67] Beside science, travels and trading also fecundated literature: The origins of the famous tales of Sindbad the Seafarer are to be found in the mercantile environment of the Indian Ocean. The Persian poet Sa'adi (d. 1290) of Shiraz tells in his *Gulistan* (Rose Garden) of a trader who became rich thanks to his contacts in Turkestan and Hindustan.[68] The trading with India was actually a prime mover of the navigation on these waters itself, as the hulls and

masts of most ships were made of teak and coconut wood and sails were woven from the leaves of coconut or palm trees, besides cotton.[69]

From the Xth century onwards, maritime trade in the Mediterranean passed into the hands of merchants from first Amalfi, then to Venice, Genova and Pisa, who established trading stations and own quarters in many towns of the Levante and North Africa.[70] The beginning of the crusades from 1096 onwards had the welcome side effect to integrate Western Europe into the well-established trading system of the Orient. Italian and Flemish merchants met in the fairs of Champagne in northern France to exchange silk and spices for Flemish woolen and linen cloth, for which there was a lively demand in the Orient.[71] These fairs took place in the towns of Troyes, Lagny, Bar-sur-Aube and Provins, each situated at intersections or former way-stations of Roman roads, between the years 1120-1320.[72]

The enterprising nature of Italian merchants is well-known to us from Marco Polo (1254-1324), whose book recounts the travels of his father and uncle Niccolo and Maffeo Polo to the court of Kublai Khan in Khanbaliq [today's Beijing] and later his trip with them (1271-1295) and their 17-year stay in China. While the onward journey of Marco Polo was on the Silk Road, on the retuen trip he made a sea voyage from Canton to Sumatra, then on to the Coromandel coast, Quilon, Cambay in Gujarat, finally landing at Hormuz. His book was immensely popular and was translated into several languages in the XIVth century.[73]

Spices were brought by Moslem, Indian or Jewish traders from the Malabar coast and Molucca islands to Tripoli in Syria or Cairo via Aden [PM1 p. 106]. From there, the goods were loaded on to ships of the Italian republics. From Venice, they were moved over dangerous paths of the Alps to the "Kontors" of the German trading dynasties of Fuggers, Welsers and Tucher, who controlled the trade in the XV-XVIth centuries.[74]

The Chinese appeared again in the Indian Ocean during the early XVth century. Emperor Yongle (1403-1424) of the Ming dynasty ordered the construction of a fleet to explore the seas around China. Between 1405 and 1433 , the Chinese fleet, which consisted of 62 treasure ships, 190 smaller supporting ships and carried up to 40'000 soldiers, made seven voyages to Sumatra, India, Sri Lanka, then to the Straits of Hormus and then down the East African coast until Mozambique. The voyages were part exploration, part diplomatic mission, but also part trading. They were led by Admiral Zheng He [or Cheng Ho], from a Muslim family in southern China, who was captured in 1382 by imperial troops, castrated and placed into servitude for a Ming prince.[75]

"Through the repeated voyage circuits of Cheng Ho there clearly emerged a notion of five different maritime zones in the Indian Ocean, with the first comprising the South China Seas and the South-East Asian regions. In most of his voyages Cheng Ho used to visit Malacca …. which had already been a prominent trade centre by 1400….The second circuit of Cheng Ho was in the Bay of Bengal, where the junks used to frequent the ports of Bengal, Orissa and Coromandel. The third maritime zone was the west coast of India, where the pepper ports of Kerala like Calicut, Cochin and Quilon formed the core of his circuits, which at times used to extend up to Mangalore, Bombay and Cambay. Hormuz of the Persian Gulf and the Arabian ports of Aden and Mecca formed pivotal exchange centres…The fifth zone was East Africa, where his voyages concentrated mostly on Mogadishu and Melinde".[76] These Chinese excursions had no lasting effect, as later Ming emperors ordered the fleet home and stopped their naval activities.

The role China might have played in the trade of the Indian Ocean was taken up a century later by the Portuguese state, which expanded aggressively, occupying Goa (1510), Malacca (1511) and Hormuz (1515), establishing fortresses in the Malabar coast, e.g. in Quilon in 1519. "The regular patrolling of the Red Sea from 1502 onwards and the frequent attacks of the Portuguese on the al-Karimi merchants linked

with the Calicut-Egypt trade made many think that the old Mediterranean route from India was dying out. Even the big commercial houses of Germany including the Fuggers and the Welsers closed their business establishments of Venice and opened their outlets in Lisbon in 1501.[77]

However, the emergence of the Ottomans in the Near East changed the picture again and prevented a potential Portuguese hegemony. Crushing the Mamluks in Egypt in 1517, capturing Bagdad in 1534 and Basrah from the Saffavids in 1538, all transit centres for the caravan trade passed into the hands of the Ottomans:

"The land space between the western Indian Ocean and the eastern Mediterranean for all practical purposes turned out to be Terra Turcana controlled by Pax Turcana, which provided enough safety and security needed for the movement of high-valued commodities like bullions, precious stones, spices from one point to another. In due course the Ottomans saw to it that this strand of trade of the Indian Ocean with the Mediterranean was developed as a parallel circulatory process to the Cape route commerce, at times exceeding it in its composition, volume and value".[78] *"With the flight of the al-Karimis from Calicut [in 1513 following the entry of the Portuguese into Calicut] to the safer ports of Gujarat, Vijayanagara, Hormuz and the Red Sea fearing vengeance from the Portuguese, the [muslim] Marakkar traders of Cochin and Cannanore…started sending spices to the western doors of the Indian Ocean following the occupation of Cairo and Suez from the hands of the Mamluks".*[79]

From 1540 onwards, a lot of spices moved to Basrah, then to Tripoli in Syria via Bagdad – Aleppo, or via the desert route to Damascus.[80] As a consequence, the Venetian trade also revived from the 1540s onwards. *"In 1545 several Ottoman traders went to Bengal, Pegu, and Tenasserim to take pepper coming from the Kerala ports to the Ottoman ports of the Red Sea".*[81] *"A major strand of Indo-Ottoman trade was through the port of Surat, whose trade happened to be predominantly controlled by Ottoman-related merchants or governors….In the beginning of 1580s the captain of the port of Surat* [which had been occupied by Moghul

emperor Akbar in 1574], *Qilij Khan Andijani, originally a Turk, started sending ships to the Ottoman ports of Red Sea without the Portuguese* cartaz *or* licence*, which led to a chain of conflicts between the Portuguese and the Mughals…".*[82]

An important aspect of trade is information about market conditions, especially prices. The Portuguese state officially controlled information about their sea voyages and market conditions in India. However, alternative information routes made it difficult for the Portuguese state to control pricing, so that eventually it had to disband its monopoly 1570. *"The private traders including Konrad Rott, later the Fuggers as well as the Welsers from Germany and Giovanni Rovallesca of Milan from Italy, who took up the Asian contract (to fetch spices from India and supply them at Casa da India at Lisbon) and the European contract (to collect spices from Casa da India and distribute them all over Europe) from 1575 onwards could no longer depend on the communication system of the Portuguese…These business houses sent their own trade agents to India, who were to operate under the instructions of their masters located at Augsburg or Milan".*[83] From the 1590s, the Fuggers opened an overland courier service which took letters from Augsburg to Goa within 6 to 8 months via Venice, Aleppo and Hormuz.[84]

Another important information channel was the annual hajj pilgrimage to Mecca, so that "Jidda as well as Mecca became the hubs of information networking between India and the Mediterranean".[85] In addition, the synagogue of Cairo *"acted a hub of mercantile information for the Jewish merchants linked with the commerce of India and the Mediterranean. The trade documents obtained from the Cairo Genizza attest to the long-standing role that the synagogue of Cairo used to play in disseminating commercial information….from the eighth to the thirteenth centuries….By the 1540s we find the Jews of Cochin and the Christian converts from Judaism…entering into an alliance to get linked with the information hub of Cairo" .*[86]

We can conclude that significant trade between China, India, the Near East and the Mediterranean basin existed from

at least the IXth to the XVIth centuries, before the Portuguese entered the Indian Ocean, even if we exclude the Silk Road from consideration. The players were Chinese, Indians, Arabs, Nestorian Christians, Jews, Ottoman Turks, Germans, Italians, among others.

Roses

We have seen that trade between China, India and the Mediterranean area is many thousands of years old. Trade records naturally concentrate on valuable commodities such as spices, silk, bullion, jewels. Looking beyond roses, we have seen how tulips and other bulbous flowers have found their way from Central Asia to Europe, valued by Turco-Islamic garden lovers. One of the outcomes of the expansion of Islam was that many plants, fruit and vegetables were imported and planted in other countries of Islamic world. Rice, eggplants, spinach, artichokes, sugar cane, cotton, water melons, lemons, mangos and coconut found wider distribution.[87] Clearly, moving seeds, if not whole plants from station to station with trips of up to one month was possible with the means of transport existing until the XVIIth century.

Early rose history on the distribution of Asian roses to the West has been in the hands of XIXth century English and French authors, who have written from their perspective, based on the information available to them at the time. It is time to look at Chinese, Indian, Persian, Turkish, Arabic sources to complete our understanding of Roses. It is in these countries that gardening culture was in full bloom for centuries, while private flower gardens were rare in Europe prior to the Renaissance.[88] History also tells us we should be looking at Northern India, Northern and Western Iran, Central and Eastern Turkey, Oman, Aden, Egypt, Northern Africa, Sicily and Southern Italy, Southern Spain and Portugal for Found Roses if we want to have a chance to find early cultivars outside of China.

Some possible areas of further research are touched below:

Rose de Provins

A popular myth about the introduction of the 'Rose de Provins' or *Rosa gallica* 'Officinalis' to Europe is that Thibaut IV (1201-1253), the count of Champagne and Brie, brought it to Provins in his helmet around 1240 on his return from the crusades.[89] The story was first brought in the "Cours complet d'agriculture"[90] and expanded on by later authors.

The truth is that the 'Rose de Provins' was grown around Provins for conserves and medical applications, and that, as we have seen above, Provins was one of the four Champagne fairs between 1120-1320. The fairs were indeed supported and protected by the Counts of Champagne and Brie, especially Henri I (1127-1181), grandfather of Thibaut IV.

Daniel Lemonnier has found an earlier text on *Rosa rubra* in the commentary on the Salerno *tabulae* by Magister Bernard Provincialis of Arles, who studied at the Salerno Medical School and in Montpellier, written ca. 1150-60[91]:

Rosa rubra pulcher flos est. Est enim speciosa dum conspicitur, aromatica dum sentitur, amarella dum gustatur. [The Red Rose is a beautiful flower. It is beautiful to see, fragrant to smell, bitter to taste][92]

Salerno is in the south of Italy, near Naples and Amalfi, whose merchants were involved in the Eastern trade. The medical school was established around 950 and translated many Arabic pharmacological texts to Latin. Its classical period started in 1077 with the arrival of the Arabic doctor Constantine Africanus.[93] A year earlier, Salerno had been captured by the Norman Robert Guiscard, from 1191 it became part of the Holy Roman Empire under the German Hohenstaufen dynasty. The Hohenstaufen emperors, especially Frederick II (1194-1250), were very learned, spoke many languages, and employed Jews and Arabs to create a cultural synthesis.

The Tabula IX Column 1 which Bernard refers to lists a number of ingredients which are "cold in the first degree", among which is *Rosa*.[94] Bernard's commentary specifies this as *Rosa rubra*. It is thus much more probable that *Rosa rubra* moved from Italy to the market place of Provins along the established trade routes, where an enterprising merchant or apothecary started the cultivation of what became 'Rose de Provins'. If it was known in Salerno in the 1150s, then its earlier history has to be researched in Arabic pharmacology, e.g. in Avicenna's[95] (Ibn Sīnā) works.

Rosa damascena

A widely cited study has established via DNA analysis that both the Summer and the Autumn Damask have originated from the crossing (*R. moschata* x *R. gallica*) x *R. fedtschenkoana*.[96] Or so I thought….

My first question was, where the crossing with the very rare *R. fedtschenkoana* might have taken place. This occasionally repeating wild rose is "native to the foothills of the Ala Tau, Tian-Shan and Pamir Alai mountain ranges in central and northwest China".[97] This is exactly the region which is the original home of the tulip, but not exactly an area where you would expect to find a Gallica x Moschata seedling. Would the nomads have taken *R. fedtschenkoana* with them on their travels west- and southwards? Not impossible, but less probable than with tulip bulbs. "Ornamental Plants from Russia" also mentions Himalayas, Mongolia, northern China and Afghanistan, so a certain distribution in the directions of nomadic expansion seems to have happened. On the other hand, "Flora of Pakistan" treats it as a synonym of *Rosa webbiana*, and "Flora of the USSR" states "This species … appears to be one of the many races of the composite species *R.webbiana*".[98]

So what actually had Iwata et al. analyzed? They compared DNA sections of 5 roses received from Beales ('Quatre Saisons', 'Quatre Saisons Blanc Mousseux', 'Kazanlik', 'York and

Lancaster', '*R. gallica officinalis*'), three examples of *R. phoenicia*, two *R. moschata* (from Chiba University and a seedling from Chiltern), two *R. moschata nepalensis* (from the Hiroshima Botanical Garden) and one *Rosa moschata plena* from the same accession. Clearly, the aim of the study seems to have been to prove or disprove Hurst's hypothesis on the origins of Damask roses.[99] A number of objections can be made hereto:

- the number of accessions is too narrow to determine whether the real "type" was investigated (nurseries and botanical gardens are often notoriously inexact)

- in the comparative direct sequencing of certain spacer regions of chloroplast DNAs, an exact equivalence was seen between a region of *R. moschata nepalensis* with *R. damascena*, from which Iwata et al. conclude that *R. moschata* is one of the female parents. If we are talking here about *R. brunonii* Lindl., then we have quite a different hypothesis for the origins of the Damask rose, as *R. brunonii* brings us definitely closer to the Himalayas, Kashmir, Afghanistan. Unfortunately, Iwata et al. seem to make no differentiation between *R. moschata* and *R. brunonii*.

- One of the primer sequences of *R. damascena* was identical to that of *R. fedtschenkoana*. However, other Cinnamomea-type roses which are prevalent in the region and can repeat, such as *R. webbiana* Wall. ex Royle or *R. beggeriana* Schrenk were not analysed at all to check if they might possibly carry the same section.

A critique of "The triparental origin of the Damask rose" can be found in the forum planten.[100]

"Flora of the U.S.S.R" tells us under *R. beggeriana* Schrenk: "In Central Asia, this plant is often cultivated as an ornamental and on enclosures".[101] Its distribution extends from Xinjiang to Afghanistan, Beludzhistan, Iran, Kurdistan and Eastern Turkey, widely corresponding to the Turco-Mongolic geography. Tan and Zieliński describe two garden roses found in the Eastern Anatollian provinces of Elazığ and Van

under the name of "Tevrizi gülü" (Rose of Tabris), "Kişmiri gülü" (Rose of Kashmir) or "Ahmediyye gülü" (Rose of the order of Ahmediyye)[102], which were first described by the late Professor Turhan Baytop as *R. laxa* var. *harputensis*.[103] This is a "very fragrant, small, milky white, double-flowered cultivar used for scenting the well known mulberry treacle prepared in these provinces under the name dut pekmezi".[104] The authors identify these as a double form of *R. beggeriana*, flowering late May to August resp. June to September. Is this possibly an OGR which has played a role in the origination of *R. damascena*? The allusions of local names to Tabriz (the early capital of the Safavids) and Kashmir (the favoured summer retreat of Shah Jehangir and other Mughal emperors) are enticing. Shah Jehangir actually had many flowers of Kashmir painted by the artist Ustad Mansur, including the famous painting of a red tulip (ca. 1610). Another study from Iran established a distinction of *R. beggeriana* accessions from the provinces of Tehran, Hamedan and Mazenderan from a double-flowered variety found in Hamedan.[105]

Other OGRs have survived in the sparsely populated Eastern Turkey. Dominique and Edith Lanvin of the Pépinières Brochet-Lanvin in northern France have collected found roses in the area, and named them "Altiparmak", "Ardahan", "Hotel Pazinler", "Igdir", "Rize" according to the site where they were found. Some of these are damasks or damask perpetual. A garden with found OGRs – the so-called "Van gülleri" - is being established at the Yüzüncü Yıl University in Van.

Studies of *R. damascena* plants in Isparta, the main rose-growing region of Turkey and in Bulgaria, showed that all 'Trigintipetala' accessions, 'York and Lancaster' and 'Quatre Saisons' possess identical genotypes.[106] This is a confirmation of the historical assumptions that rose cultivation for rose oil and rose water in Bulgaria was started by a Turkish judge in the late 17th century who moved to the Kazanlik region from Tunis[107] and the production in Isparta was started by Turkish refugees from Bulgaria after this county's independence in 1878.

A study from Iran, however, found different genotypes in the Kashan, Kerman and Tabriz regions.[108] This could be an indication that the origin of *R. damascena* has to be sought in Iran and that we are dealing not with a species but with a complex of cultivars, of which one has been used by Miller to define the "type".

Rosa moschata

A similar situation exists with *R. moschata* Herrm., where Johann Herrmann described a version known to him as the type. Meanwhile, we know that there is a whole range of moschata-type roses (*R. ruscinonesis, R. abyssinica, R. freitagii, R. godefroyae, R. brunonii, R. sambucina*, etc) extending from south of France over Northern Africa to Japan, which may or may not be species, natural hybrids or cultivars.[109] Ivan Louette e.g. proposes *R. abyssinica*, which is found in Ethiopia, Eritrea, northern Somalia, southern Saudi Arabia, Yemen, as a possible parent of *R. damascena*.[110]

Helga Brichet is showing in this Convention a separate presentation on roses found by Vicky and Isabella Ducrot of Italy during various collecting trips in Asia. Among these are various moschata-types found in Yemen, Iran (Mazandaran, Shiraz), India (Himachal Pradesh) described and pictured in "Un Giardino per le Rose".[111] In this context we should also remember that 'Rose d'Alexandrie', was an early synonym of *R. moschata* or *R. damascena*, with Alexandria being the Mediterranean port at the end of the maritime route from India.[112]

We have seen above that Babur knew and had *nastaran,* which is probably *R. glandulifera* Roxb.[113] (*R. moschata plena*), in his garden at Agra. The Encyclopedia Iranica, however uses *Nasrin* for *R. moschata plena*, a name which does not appear in Babur-nama. The cited references date *R. moschata* to 1513 and prior.[114] A French voyager reported seeing *R. moschata* in 1796 in the royal gardens of in Isfahan: "*The chief object of his attention in the palace-garden seems to have been a rose-tree, which*

was at least fifteen feet high, very luxuriant in branches, and formed by the union of several stems, of four or five inches diameter each. At Ispahan it is called the Chinese rose-tree*, but the seed, raised in the Parisian garden, has produced the common musk-rose which is cultivated in Europe*".[115]

I am certain that with more research, we will find evidence of the distribution of *R. moschata* and its hybrids prior to the XVIth century throughout the Islamic World. Exact identification of the species as known to us will be very difficult, if not impossible, as standardized botanical terms have come much later into being. We could, however, attempt a comparative collection of all the various forms in Africa and Asia and design a genetic study which aims to determine if there is an original *R. moschata* species, or all forms are hybrids of some kind. The Iranian and Arabic terms are in fact pointing to a Chinese origin.

Rosa Centifolia

Babur does not mention *R. centifolia* in "Baburnama", but invents the name centifolia tulip *[şadbarg lãla]* for a multi-petalled tulip he had seen, so I am presuming must have known the Persian term *gol-e-şadbarg* (hundred-petalled rose). Indeed, "Abunaşri Heravi, the author of Eršād al-zerā'a, (comp. 921/1515-16), in a chapter on "gol-e sor and the like" (pp. 202-7), mentions sixteen kinds of gol [rose, among which]….*gol-e-sorḵ-e rasmi* "standard red rose", "from which *golāb* (rose water) is obtained"; *gol-e-sorḵ-e-şad-barg* "hundred-petaled red rose" …gol-e-zard-e-şad-barg "yellow hundred-petaled rose [i.e. *R. hemisphaerica*]."[116] Ottoman miniatures, tiles and pottery from the 1550-1570s show stylized centifolia-type roses.

The origins of R. *centifolia* may actually go back even much further. According to the "Encylopaedia Iranica", the *Bundahišn*, lists *gul* as one of the fragrant flowers, particularly mentioning "*gul I sad-warg* "the hundred-petalled rose" (cf. *R. centifolia* above) as belonging (or attributed to the Divinity

Dēn".[117] The *Bundahišn* is a collection of Zoroastrian scriptures, which was written mostly in the VIIIth/IXth centuries after the Arabic conquest of Iran. It is known in an Iranian and an Indian version, the latter as a result of the Parsi community in India, who had migrated in the VIIIth to Xth centuries from Iran in order to avoid persecution due to their belief.

Daniel Lemonnier illustrates the existence of *R. centifolia* as mentioned by Plinius, with a Roman mosaic from the Villa Hadrian (ca AD 120) in Rome.[118] While it might be difficult to bridge the 1000-year gap, further research in the Near East could well add several hundred years to the history of Centifolias. Its origin in Sassanid Iran seems most probable.

The assumption that the Centifolia was imported into the Low Countries, as was the Tulip, would explain why it has been impossible to find any mention of this rose class in Western Europe before the 1580s and its sudden appearance as plants with large, globular blooms.[119] We also need to look at the history of the 17 Provinces which formed the Low Countries in the XVIth century to understand the environment of the time. These provinces were acquired by the Habsburgs from the Duchy of Burgundy from 1482 to 1543. With the division of the empire in 1555, the Provinces were assigned to the Spanish kingdom of Philip II, son of Charles V. The heavy-handed Spanish rule in taxation and religious matters led to the outbreak of the Eighty Years' War between Spain and its Dutch subjects in 1568. The Seven United Provinces declared their independence from Spain in 1581. The war ravaged especially the remaining 10 Provinces of Spanish Netherlands (today's Belgium and Luxembourg). This was no time to peacefully grow roses.

The name *Rosa provincialis*, which became a synonym of *R. centifolia*, has nothing to do with the Provence, but with the 17 "Provincie".[120] While they might not have bred *R. centifolia*, the Dutch certainly perfected it in the XVII/XVIIIth centuries, as they did with the Tulip.

What could have been possible routes for the importation of Centifolias to the Low Countries? Firstly, the main port of the region was Antwerpen in the Spanish Netherlands. The Portuguese State had one of its most important trading Contors in this city and directed most of the trade with northern Europe via Antwerpen. Secondly, significant amounts of Flemish Protestants had emigrated to the Protestant principalities of Germany, where they were safe from the Spanish Inquisition. When speaking of the *R. centifolia Batavica*, Carolus Clusius reports that not only Jan von Hogheland in Leiden grew this rose, but also the Belgian brothers Balthasar and Karel Hoyke, who lived in Frankfurt am Main.[121] This town lies on the German trading route from the Mediterranean to the North.

Rose Edouard

When I read the story by Loiseleur-Deslongchamps of the origination of 'Rose Edouard' as a chance seedling formed among hedges of Bengal roses and Rosa bifera, and that Bréon discovered this in a hedge on the property of M. Edouard Périchon[122], I was somewhat skeptical, especially as the said rose apparently bloomed only three months afterwards when re-planted in the Botanical Garden of the Ile Bourbon: Bréon must have had an excellent eye to spot a distinct rose among Chinas and Damasks just by its foliage and habit.

Reading further, I found that the story was treated skeptically by other contemporaries. Louis Chaix writes: ''*Sans adopter pleinement cette opinion, que je crois au moins hasardée, je reconnaitrai volontiers, avec M. Loiseleur-Deslongchamps, que MM. Jacques et Bréon, en nous faisant connaître cette nouvelle espèce, ont dote le pays d'une excellente acquisition. On m'a assuré que ce rosier est depuis longtemps très-répandu à l'ile Bourbon et à l'ile Maurice où il sert à former des haies. On l'y appelle Edwards ; tel est aussi le nom sous lequel cet arbuste a été introduit en France…*"[123]

Joseph Neumann, who worked under Bréon in Saint Denis from 1821-1824, explained the origins as this being a rose brought from India to Mauritius and named 'Rose

Edward' by the widow of a rich merchant who had ordered it as a memento to her husband's name.[124]

"Hortus Mauritianus" of 1837 lists a China Rose as having the common name Rose Edouard, native of eastern Indies (Inde orientale), cultivated in gardens, shrub, blooms almost all the year.[125]

Two contradictory stories, a possible link to India – an intriguing puzzle to solve…

First: Any rose hedges on the islands of Ile de France and Ile Bourbon?

Some records were found, but they speak of hedges of China roses…Bernardin de St Pierre wrote on June 10th, 1769 from Mauritius: "nous avons ici le rosier qui multiplie si aisément qu'on en fait des haies. Sa fleur n'est ni si touffue, ni si odorante que la nôtre ; il y en a de plusieurs variétés, entr'autres une petite espèce de Chine, qui fleurit toute l'année".[126] A publication from 1828 describes hedges of China roses along some roads[127] Daniel Lemonnier also cites François-Etienne Le Juge, counsellor on Ile de France : "M. Omerat, commandant de la frégate La Reine m'apporta de Cadix ceux [rosiers] qui sont multipliés aujourd'hui dans tous les habitations dans les deux Isles, des fleurs desquelles on fait de l'eau de rose excellente. Cet arbuste vient icy si facilement qu'on peut en former des hayes en peu tems".[128] The hypothesis that these roses from Cadiz were *R. damascena* bifera is far-fetched, a more obvious assumption would be *R. sempervirens* L., which grows naturally in the Cadiz area, could be used for making rose-water, and was mentioned later in publications as existing on the islands.

Second: R. damascena on the islands?

The listing of roses at the St. Denis Botanical Garden, compiled by Bréon himself, lists a *R. semperflorens* (de tous le mois) beside other roses.[129] Strangely, this is the only mention in contemporary literature that 'Quatre Saisons' might have existed on the two Mascarene Islands.

Milbert, in his book on his travels, mentions only China Roses on Ile de France in 1801.[130] The catalogue of plants in the botanical gardens of Mauritius from 1816 lists *R. semperflorens* as a China, but no *R. damascena*.[131] Another publication based on data of 1825-1830 lists 'Rose Edouard', but still no Rose bifere.[132] "Hortus Mauritianus" lists beside 'Rose Edouard' two types of *R. semperflorens* (china, refers to "Curtis's Botanical Magazine", t. 284), but again no Damask. Wenzel Bojer also mentions that *R. semperflorens* also grows wild around abandoned homesteads in the quarters of Plaines-Wilhelm and Moka.[133]

In any case, the last part of statement by Thomas Rivers, "Monsieur Bréon, a French botanist, and now a seedsman in Paris, gives the following account for the truth of which he vouches:….it flowered the following year, and as he [M. Bréon] anticipated, proved to be of quite a new race, and differing much from the above roses, which, at the time, were the *only sorts known in the island*"[134] is evidently false.

It also seems that OGRs do not grow well in the tropical climate. Ile Bourbon is a volcanic island, with a year-round temperature range of 16-30 °C. The district of Saint Benoît on the eastern coast of Réunion has a tropical climate with temperatures not dropping below 20 °C and is today known for growing orchids. In the early XIXth century it contained plantations of cloves, nutmeg and bread-fruit.[135] Would hedges of R. damascena have flourished and bloomed in such a climate? If these hedges were so prevalent, why where there not more China x Damask seedlings, but only this one plant?

Third: Did Edouard Périchon exist?

There was indeed an Edouard Périchon on St. Benoit on the northeast coast of Ile Bourbon as Brent Dickerson has identified: Edouard Marie Périchon de Sainte Marie (1789-1866), member of an extended Périchon family[136] whose members have lived in Pondicherry (India), Ile de France (Mauritius since 1810 under British occupation) and Ile

Bourbon (Réunion), who apparently moved between the two islands.[137] The connection to "Pondicherry on the Coromandel Coast, where the French were granted leave of settlement by the Mughal emperor in 1673, was the French capital of southern India"[138], and the clear family connections on Mauritius and Réunion lends credence to Joseph Neumann's version of the Indian origin of 'Rose Edouard'.

During the Napoléonic Wars, the Mascarene Islands were the side arena of battles between the French and British during 1809-1811. After initial successes by the French navy, British forces occupied Ile Bonaparte (the new name of Ile Bourbon) on July 7-9, 1810 but were seriously defeated at the Battle of Grand Port on Ile de France on August 22, 1810. The British sent reinforcements from Madras, Bombay and the Cape of Good Hope and finally captured Ile de France on December 2.[139] Ile Bourbon was returned to France after Napoléon's abdication in 1814. The travel descriptions of Sir James Prior (ca. 1790 - 1869), an Irish surgeon, who visited the islands immediately after the occupation, provides valuable contemporary background information. He writes:

"*…the population* [of Ile Bourbon]*…is said to exceed 100,000…A more moderate calculation makes the whites along with their half-cast offspring , not more than 10,000; free people of colour [mostly Indians] about 4000; slaves, probably, nearly 50,000…The foreign commerce of the island, even in its better days, centered principally in Mauritius…The produce of Bourbon occasionally supplied Pondicherry in a period of peace, or was exported to France, which in return sent out cargoes adapted to the trade with the natives of Madagascar, or of the African continent, and the Arabs of the island of Zanzibar, and of their capital, Muscat, in the Persian Gulf*"[140]

When Bréon arrived on Ile Bourbon in 1817, Edouard Marie Périchon would have been 28 years old and the estate on Saint Benoît might have been his or his mother's, as further research will show. I am presuming that 'Rose Edouard' or 'Rose Edward' in Mauritius (British since 1810) was a family

heirloom, shared and grown by family members on both islands.

Jean-Nicolas Bréon's (September 27, 1785 Sierk (Moselle) – 1864) story exists only as retold by Loiseleur-Deslongchamps, and not in his own words, which is at least peculiar, as he became a nurseryman on his return to France and founded and presided the *Cercle des Conférences Horticoles du Département de la Seine*, a society of nurserymen and florists of Paris, in 1841. His main interest during his stay was acclimatisation of economically valuable plants such as coffee, nutmeg, cocoa, sugar cane, not Bourbon roses.[141]

Already during 1852-1853, the origins of 'Rose Edouard' were questioned. The botanist Joseph Decaisne (March 7, 1807 Bruxelles – February 8, 1882 Paris) contacted Jean Michel Claude Richard (August 16, 1787 Volon – 1868), French botanist and successor of Bréon as Director of the Jardin de l'État in St Denis, for his comments. Richard's letter of April 4, 1852 states : ''Ce Rosier n'est pas de Bourbon, où il porte généralement le nom de Rosier Edouard, nom qui lui vient d'un nommé Edouard qui, à ce qu'il paraît, l'aurait trouvé, il y a bien des anneés, sur une ancienne habitation abandonnée de la Compagnie des Indes, quand elle possédait l'île Bourbon. J'ai toujours considéré ce rosier comme étant, si je ne me trompe, celui que De Candolle désigne sous le nom de Rosa Indica, mais qui, je crois, n'est pas des Indes, mais plutôt de la Chine ou du Japon."[142]

Ile de France and Ile Bourbon were under the administration of the French East India Company until 1767, shortly before it was dissolved. First concessions for the Saint Benoît region were given 1720-1733 for the planting of coffee. If the origins of 'Rose Edouard' can be traced to this period, it would antedate the Périchon family, which first moved 1774 from Pondichéry to Ile Bourbon.

What are then early traces of 'Rose Edouard' in India? Of all countries in the world, it is widestly cultivated throughout

India, especially in Uttar Pradesh in the Ganges Valley, Sindh, Chakwal in Punjab, Hyderabad, Mysore in Karnataka, Thanjavur in Tamil Nadu, south of Pondichéry. Local names are "Cheenia Gulab" (China rose), "Desi Gulab" or "Baramasi" (12 months).[143] It could therefore have been expected to find descriptions of this rose, preferably before 1820, to prove the Indian origins. Unfortunately, the status of sources is still meager:

Jean-Baptiste Leschenault de la Tour (1773-1826), French botanist, had established the Jardin Royal de Pondichéry in 1817 and issued several Mémoires on plants cultivated in the region, but only about plants of economical interest[144] only treated grains and vegetables. The catalogue of this Botanical Garden from 1829 contains *R. sinica, R. centifolia, R. semperflorens, R. multiflora, R. diversifolia,* but no Garden Roses.[145]

William Roxburgh, in his "Flora Indica", published posthumously in 1832 mentions only species roses, but includes *R. centifolia*.[146] A first mention is from a gardening calendar for November in 1841: "Open out the roots of Bussorah roses for succession, also of rose Edward and Madras rose, cutting down the branches; trim sweet briar, and the many flowered rose."[147] Frederic Barlow Speede then offers a classification as a centifolia and a local synonym:

"The ***Madras rose****, or Rose Edward, a variety of R. centifolia,* Gul ssudburuk*, is the most common, and has multiplied so fast within a few years, that no garden is without it; it blossoms all the year round, producing large bunches of buds at the extremities of its shoots of the year; but, if handsome, well-shaped flowers are desired, these must be thinned out on their first appearance, to one or two, or at the most three on each stalk. It is a pretty flower, but has little fragrance. This and the other double sorts require a rich loam rather inclining to clay, and they must be kept moist"*[148]

In the same publication, he mentions that the Madras rose blooms January-March, April-June, August-December, quite

parallel with the China rose. Later authors either plagiarize Speede, or do not add more to his description. The name Madras rose seems to have gone out of use after the XIXth century.

The "Ayeen Akbery" from the XVIth century has a few tantalizing references to roses, but is not specific enough.[149] Speede's text implies that 'Rose Edward' was a recent introduction prior to the 1840s, which could mean that it was carried back from Mauritius to Madras (today's Chennai), a British base. On the other hand, Madras is only about 160km north of Pondichéry. Further investigation of publications from 1750-1840 in India, or earlier, is necessary to resolve the 'Rose Edouard' mystery. An intriguing aspect is Speede's classification of 'Rose Edward' as a *centifolia*, although the term *R. borboniana* was already well established by that time. Was he possibly basing this on a local characterization?

A recent comparative analysis of essential oils of roses grown in the Punjab showed great similarities in the essential oil spectrum of *R. borboniana* (Rose Edouard), *R. centifolia* and *R. damascena*, underlining the close relationship of these roses.[150] Further genetic research on the various types of 'Rose Edouard' , R. centifolia and R. damascena found in India and the Near East is needed.

Conclusion

Current rose history is still very much based on myths created in the early XIXth century. As the systematic analysis of *R. moschata* and Noisettes in USA has shown, it is today possible to come to more factual conclusions. Still, many genetic studies on roses are made without taking essential questions into account and are sometimes based on roses of dubious provenance, such as the 'Park's Yellow Tea-scented China' in commerce. The rose community can define relevant questions as to the origins of our roses. These cannot be resolved with the traditional Eurocentric viewpoint; it is imperative to involve rose lovers and experts from Asia and

Africa to arrive at new insights. The missing links in history must also be filled. Today, classification of Rosa species is often based on few herbarium specimens collected in the XIXth and early XXth centuries, resulting in an extensive subdivision which highlights minor variations, instead of relationships. We need new research, based on field studies, which will set comprehensive standards as De-Yuan Hong had done for *Paeonia*.

While our focus is rose history, studies on the dissemination of other Asian plants are also valuable to understand the trading history, offering us a chance to track the way *Rosa* has taken through the centuries from China and Central Asia to our gardens.

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110 IL3: "La rose d'Abyssinie", Ivan Louette, in www.amoons.be/botarosa, 2002/2005 and IL4: "Les roses des "Quatre Saisons"", Ivan Louette, in www.amoons.be/botarosa, 2002/2005

111 VD: "Un Giardino per le Rose", Vicky and Isabella Ducrot, Roma 2001, pp. 16ff, 31ff, 35-37, 71

112 JB: "La Flore Jardinier", J. F. Bastien, Paris 1809, p. 382 (*Rose d'Alexandrie voy. RosierMusque*) ; and ALF : "Cours d'histoire naturelle pharmaceutique", A. L. A. Fée, Vol. 2, Paris 1828, p. 128 (*R. damascena la rose d'Alexandrie ou rose pâle de la pharmacopée de Madrid*).

113 WR: "Flora Indica, or descriptions of Indian Plants", William Roxburgh, Vol. II, Serampore 1832, p. 513ff : "*R. glandulifera, R. …Beng. Swet or Sheooti gulab. Found in gardens throughout India, where it is commonly called the white rose… Where this plant is indigenous is uncertain, probably China, as I know it has been brought from thence to the Botanic garden at Calcutta.*"

114 EI: "Gol", in "Enyclopaedia Iranica", in www.iranicaonline.org, (***Nasrin***. *Some lexicographers (e.g., Dā'i-al-Eslām) believe it to be the same as nastaran, but Manučehri has mentioned both as two different flowers in the same poem (ll. 1513 and 1524). His description "nasrin dahān ze dorr-e monażżad konad hami" (the nasrin makes [its] mouth of strung pearls) would indicate a double white rose; de Fouchécour (p. 85) defines nasrin as "small white hundred-petaled rose," apparently translating nasrin's definition in the Borhān-e qā-e' (ed. Mo'in, p. 2139), where it is vaguely described as being of two kinds, gol-e moškin "musky rose" (probably the above R. moschata, called nasrin also in Arabic; cf. Issa, p. 157, n. 10), and gol-e nasrin, which in Arabic is called* ward □ini "*Chinese rose*" and ***Nastaran***. *Another horticulturist, Abunasri Heravi, the author of Eršād al-zerā'a, (comp. 921/1515-16), in a chapter on "gol-e sork and the like" (pp. 202-7), mentions sixteen kinds of gol [rose]: ....**nastaran**, with white...., red, or mala (?) flowers, "which used to be (found) in gardens [but] has disappeared now")*

115 GAO: "Voyage dans l'Empire Ottoman, &c", by G. A. Olivier, Vols. V and VI, Paris 1807 , in "The Appendix to the Sixty-Third Volume of the Monthly Review Enlarged", 1810, p. 456

116 EI, op. cit.

117 EI, op. cit.

118 DL, op. cit., p. 40

119 GK : "De rozenteelt in Nederland", Gerrit Kleis, t'Goy 2007, p. 20ff

120 idem, p. 24

121 idem, p. 23

122 JLD: "La Rose: son histoire, sa culture, sa poésie", Jean Loiseleur-Deslongchamps, Paris 1844, p. 159

123 FDS : "Histoire du Rosier Ile Bourbon", Louis Chaix, in "Flore des Serres et des Jardins de l'Europe", Gent 1851, p.77

124 JN: ''Sur la Rose dite de l'île Bourbon'', by Joseph Neumann, in ''Annales de la Société Impériale d'Horticulture de Paris, January 1853, p. 30ff

125 WB: "Hortus Maritianus", Wenzel Bojer, Mauritius 1837, p. 128

126 BSP : "Voyage à l'Isle de France, à l'Isle de Bourbon, au Cap de Bonne Esperance, &c., "Bernardin de St-Pierre, Neuchatel 1773, p. 954 : *We have a rose here that multiplies so easily that one makes hedges with it. Its bloom is not as full nor as fragrant as ours ; there are several varieties of it, among them a small species from China, which blooms the whole year.*

127 PUT: "Essai de Statistique de l'Ile Bourbon", Pierre Philippe Urbain Thomas, Paris 1828, p. 118-119 : *En avançant dans la route, on trouve la ravine Saint-Gilles , celle de l'Ermitage , celle de la Saline, puis celle des Trois-Bassins. Tout ce terrain est parfaitement cultivé : le chemin, qui n'est, à bien dire , qu'un sentier , est bordé de haies de rosiers de Chine.*

128 DL, op. cit, p. 114: *M. Omerat, the captain of the fregate La Reine brought me roses from Cadix which have multiplied today in all the homesteads of the two islands, and from whose blooms an excellent rose water can be made. This shrub grows here so easily that one can form a hedge in a short time.*

129 JNB: ''Catalogue des plantes cultivées aux jardins botanique et de naturalization de l'Ile Bourbon'', Jean-Nicholas Bréon, Saint-Denis 1825, p. 65-66: *R. burgundiaca, R. lucida, R. sinica, R. unica, R. carnea, R. moschata, misc. R. bengalensis, R. borbonica (i.e. Rose Edouard), R. pusilla, R. bracteata, R. macrocarpa, R. multiflora, R. lindlei (from Nepal)*

130 JGM: ''Voyage pittoresque à l'Ile de France, au Cap de Bonne-Espérance et à l'Ile de Ténériffe", Jacques-Gérard Milbert, Vol. II, Paris 1812, p. 121ff : *Une autre plant de la Chinese multiplie spontanément; elle porte sur chaque tige cinq ou six petites fleurs qui ressemblent à des roses. Le fleurs de la même tige sont toutes variées. C'est peut-être cette rose de la Chine que la père Kirchner* [Athanasius Kircher 1602-1680] *a eue en vue, dans sa description de la rose changeante de ces pays Le rosier se propage ici avec facilité; il y en a une grande variété d'espèces: un joli rosier de la Chine porte des fleurs toute l'année.*

131 CM: "A Catalogue of Exotic Plants cultivated in the Mauritius, at the Botanic Garden, Monplaisir, Reduit, and other places", Mauritius, November 1816, p. 15-16: *R. provincialis, R. sempervirens, R. semperflorens, R. chinensis, R. longifolia, R. macrocarpa, R. mutabilis, R. alba, R. bracteata, R. pumilla and R. burgundica.*

132 MBU : ''Statistique de l'Ile Maurice et ses dépendances'', Marie Claude Antoine Marrier Baron d'Unienville, Paris 1838, Table 72 : *Rose de Provins, Rose à cent feuilles, Rose blanche, Rose mousseuse, Rose pompon, Rose de Chine, Rose multiflore and Rose Edouard*

133 WB, op. cit., p. 128-129: *R. sempervirens, R. moschata, R. multiflora, R. nivea, R. humilis, 2 types of R. semperflorens (china), R. atropurpurea, R. bracteata, R. gallica, R. centifolia, R. centifolia muscosa, 2 types of R. burgundica and R.pomponia*

134 TR: "The Rose Amateurs Guide", Thomas Rivers, London 1837, p. 62-64

135 BSV: "Voyage dans les quatre principales iles des Mers d'Afrique", JeanBaptiste Bory de Saint-Vincent, Vol. II, Paris 1804, p. 42

136 BD: "M Perichon Sends Christmas Greetings", Brent Dickerson on yahoo group "Chez Vibert", December 23, 2009

137 CGB : Cercle Généalogique de Bourbon (www. cgb-reunion.org) and GN : Geneanet (gw2. Geneanet.org, Généalogie des Mascareignes) gives us a pretty complete family tree, of which the interesting parts are:

Etienne Guillaume Périchon de Vandeuil (- 1778 Soisson/Aisne), écuyer, Receveur Général des Domaines et de Bois de la Généralité des Moulins (Allier)

1. Marriage with Suzanne Catherine Charlotte Pougin de Novion

- 1st son : Etienne Edouard Périchon (Paris – September 24, 1829 Port Louis, Mauritius), Trésorier de lArmée in Pondichéry (India), moved 1795 to Mauritius

  married in 1769 : Anne Victorine Boistel

  children : Cathérine (b. Pondichéry); Louise Jeanne Delphine (b. May 3, 1786), Aurélie (b. October 20, 1795) and Laure (b. October 22, 1796) all in Port Louis, sons Charles and Edouard Etienne both married in Mauritius in 1821; Edouard Etienne died September 9, 1829 in Mauritius.

2. Marriage with Avoye Constance Armande Montier de Benneville

- 2nd son: Armand Etienne Périchon de Vandeuil (ca. 1746 Paroisse Saint-Roch, Paris -) Conseiller au C.S. in Pondichéry, but moved towards 1774 to Réunion.

  Married Jeanne Madeleine Abeille on July 9, 1770 in Pondicherry

  Children: Marie Josèphe Brigitte (b. 1772), Marie Anne (b. 1775), Marie Eugène? all married in Mauritius in 1790, 1792, 1831? resp., Marie Etienne Bruno (b. 1779), Marie Dominique Jean (b. 1781), Marie Charles (b. 1783), Marie Louise Thérèse (1785-1789), Marie Joseph Auguste (b. 1790)

3. Marriage with **Magdelaine Louise Lay de Serisy**

   3rd son: Jean Marie Périchon de Beauplan (b. October 23, 1758 in Paroisse Saint Nicolas des Champs – May 23, 1831 Saint Denis, Réunion), Capitaine d'Infanterie, Chevalier de St. Louis, moved 1788 to Mauritius, 1796 to Réunion

   Married 1. Marie Françoise Ache (1757-1817) on August 27, 1788 in Pamplemousses, 1 child Mauritius ; 2. Elisabeth Tardif-Desfosses (1764-1828) on August 14, 1798 in Saint Denis, 2 children

- 4th son : **Dominique Marie Périchon de Sainte Marie** (b. ca. 1756 Paris – March 7, 1792 Saint Denis), Ecuyer, Trésorier du Roi, moved to Réunion towards 1785

  Married : **Marie Jeanne Julie Pignolet de Fresne** (b. 1766) on February 19, 1787 in Saint André, Réunion. Children : Louise Marie Anne Henriette Perichon de Sainte Marie (1788-1790), Marie Louise Martine Eloïse Perichon de Sainte Marie (1791) and

  Edouard Marie Périchon de Sainte Marie (October 1, 1789 Saint Denis – 1866), married Adèle Bellier on November 10, 1810 in Saint André, Réunion

  His mother Marie Jeanne remarried on May 11, 1797 in **St. Benoît, Réunion** with Joseph Pierre Leboux Dumorier (ca. 1759 – 1801), 2 children

138 DC: "West meets East. Pondicherry and the French East India Company", Dominique Camus, in "Medicographia", Vol. 31, 2009, p. 100

139 Wiki5: "Mauritius Campaign of 1810-11", in www.wikipedia.org

140 JP: "Voyage in the Indian Seas, in the Nisus Fregate, to the Cape of Good Hope, Isles of Bourbon, France and Seychelles; to Madras; and the Isles of Java, St. Paul, and Amsterdam, during the years 1810 and 1811", James Prior, London 1820, p.22

141 AAF: ''Notice Biographique sur J. N. Bréon'', by L. Bouchard-Huzard, in ''Annales de l'Agriculture Française'', January 1865, p. 16ff

142 RH: "Note sur le Rosier Ile-Bourbon", by J. Decaisne, in "Revue Horticole", 4th Series, Vol. I, Paris December 1, 1852, p. 455ff: *This rose is not from Bourbon, where it is generally called Rose Edouard, a name which come from one named Edouard, who, it seems found it many years ago, on an old abandoned homestead of the French East India Company, when they possessed Ile Bourbon. I always considered this rose, if I am not in error, that which De Candolle designates as Rosa Indica, but which, I believe, does not come from India, but rather from China or Japan.*

143 ME: "Mansfeld's encyclopedia of agricultural and horticultural crops", ed. Peter Hanelt, Berlin & Heidelberg 2001, p.450

144 JLT : several articles, Jean-Baptiste Leschenault de la Tour, in ''Mémoires du Muséum d'histoire naturelle'', Vol. VI, 1820, p. 300ff

145 JMR : ''Catalogue des Plantes cultivées au Jardin royal de Pondichéry (Année 1827)", by Jean Michel Claude Richard, jardinière pépinièriste, in « Annales maritimes et coloniales », Vol. 13, Paris, 1828, p. 430

146 WR, op. cit., p. 512ff

147 BAG: "The Bengal and Agra Annual Guide and Gazetteer", 1841, p.CVI

148 FBS: "The New Indian Gardener and Guide", G. T. Frederic S. Barlow Speede, Vol. II, Calcutta 1850, p. 21

149 AA: "Ayeen Akbery, or the Institutes of Emperor Akber", Abū al-Fazl ibn Mubārak, ca. 1598, translated by Francis Gladwin, Vol. I (1800), Vol. II (1804): Vol. I p. 88: recipe for making the perfume *Gulkameh* with "*expressed juice of roses*"; p. 94: "*Sewty resembles the red rose, only that it is smaller*; p. 95: "*Koozeh resembles the white rose*"; p. 98: "*Here are also found abundance of flowers transplanted from Persia and Tartary; such as roses, violets, jasmin, &c.*"; Vol. II p. 44 "*Here* [in Agra] *is abundance of flowers and sweet scented Oils*"

150 AY: "Phytochemical Analysis and Potential for Exploitation of Heterosis for Essential Oil Contents in Rosa Species", Adnan Younis, Faisalabad 2006

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AS "The Empire of the Great Mughals", Annemarie Schimmel, London 2004

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FDS "Histoire du Rosier Ile Bourbon", Louis Chaix, in "Flore des Serres et des Jardins de l'Europe", Gent 1851

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GN Geneanet, gw2. Geneanet.org, Généalogie des Mascareignes

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RSM "Mirror of the Orient", Roland & Sabrina Michaud, Boston 1984

SR "Collectio Salernita", Vol. V, Salvatore de Renzi, Napoli 1859, p. 310

ŞA "Van Kenti ve Çevresindeki Geleneksel Konut Bahçelerinde Kullanılan Bitki Materyalinin Belirlenmesi", Şevket Alp, in "Yüzüncü Yıl Üniversitesi Ziraat Fakültesi Tarih Bilimleri Dergisi", Vol. 17, 2007, p. 4-6

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"Gülü seven dikenine katlanir" :
One who loves roses, endures the prickles
(i.e. "take the bitter with the sweet")

"Dikensiz gül olmaz" :
There is no rose without prickles: Turkish sayings

Map_of_the_Periplus_of_the_Erythraean_Sea

Asuman

Igdir2

Indische Oelrose

Tulipa turkestanica

Born in the forest, reborn in the garden
A tale of two Indian rose species

Girija and M.S.Viraraghavan

At the outset we would like to squarely face the question of why Indian rose species are required for breeding roses for India and other warm climate regions of the world. The answer is that work with these species makes horticultural sense. The choice is not jingoistic.

Warm climate rose breeding has been largely neglected in the world. Tropical countries depend almost completely on roses bred for cold hardiness in Europe and the U.S.A. These roses have a very short life in our heat, excepting in some favoured locations. As the Western breeding for cold hardy roses progressed from generation to generation, these roses became less and less suitable for warm areas. The early H.T.'s, for e.g.,'La France' from Europe and 'Radiance' from the U.S., were comparatively better suited for warmth, but the newer varieties, excepting for some 'freaks' cannot be grown in a sustainable way.

We have to therefore create a separate line of breeding for warm regions. Where do we start? Clearly, with the Teas, Chinas and Noisettes. Out of hundreds of these classes raised, mainly in France, in the latter part of the 19th century, only a few remain, which do well for us. But the stupendous efforts put in by French breeders led to the genetic possibilities of the strain getting exhausted. Fresh blood is thus required and this is provided by the two rose species which figure in this talk.

It is indeed fortunate that these two species – *R. clinophylla* and *R.gigantea* perform well in a wide range of warm climates.

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R.clinophylla is perhaps the world's only tropical rose species. *R.gigantea*, on the other hand, grows luxuriantly in sub-tropical climates without harsh frosts. In addition, it is blessed with great vigour and disease resistance. It is our submission that there is no doubt that these two species are the logical start for warm climate rose breeding.

R. clinophylla

Three forms exist, adapted to warm moist climate (Bengal form), warm dry climate (Chota Nagpur form) and sub-tropical climate (Himalayan foothills and some other mountain ranges). The Bengal form, is, by any criterion, the most tropical form of this species. Its habitat is described, with eye-catching detail in the 'Himalayan Journals' of J.D.Hooker, the famous plant explorer who came upon this species when his explorations brought him from the foothills of the Himalayas to the plains of North Bengal, by the banks of a tributary of the River Ganges :

"*On the 7th of May (1850), about 80 miles in a straight line from the foot of the Himalaya, we found the stratified sandy banks, which had gradually risen to a height of thirteen feet, replaced by the hard alluvial clay of the Gangetic valley, which underlies the sand: the stream contracted, and the features of its banks were materially improved by a jungle of tamarisk, wormwood (Artemisia), and white rose bushes (Rosa involucrata, now called R.clinophylla), whilst mango trees became common, with tamarinds, banyans and figs. Date and caryota palms, and rattan canes, grew in the woods, and orchids on the trees, which were covered with a climbing fern (Acrosticum scandens) , so that we easily doubled our flora of the river banks before arriving at Maldah*'.

Expanding on Hooker's observation we may point out that this species is typically found in flood plains and the islands of the Ganges, which are very often submerged during the monsoon rains.

In some ways getting a plant of this variant proved to be the most difficult of searches. Even in the late 19th century the species was characterised by the unusual feature of appearing

in profusion where the swampy conditions suited, but again showing up very much further on – many apparently suitable habitats were completely bereft of the rose. With the rapid spread of agriculture, its habitat is under grave threat, but to our good fortune, the well known horticulturist of Bengal, Dr. S. Bannerjee, had collected a plant quite near where Hooker had observed it – at the point where the River Padma branches off from the main Ganges and flows towards what is now Bangladesh. In his tiny garden in Kolkata grew a solitary plant, perhaps the only one in cultivation when we began our search from 1967. It is rather extraordinary that even the Botanical Survey of India could not give us any information. Finally, in 1990,(after two decades!) Dr. N.C.Sen, rosarian of Asansol (in West Bengal) and our friend, was able to send us a plant, made from the original with Dr Bannerjee.

The Chota Nagpur form of *R.clinophylla* had reached us earlier. Mr. Narender Singh of Ranchi, also a rose enthusiast, while on a hunting expedition, had camped by the side of a forest stream in the Chota Nagpur Plateau of Bihar State. In the early dawn light he saw, to his surprise, a rose growing by the stream's side. He recalled our interest in *R.clinophylla*, and correctly identifying this rose, he sent us some cuttings, from which our first breeding work with this species began.

Looking for the 3rd form of *R.clinophylla*, the low mountain form, involved an expedition to one of the last reported findings of this rose on Mount Abu, rising to 1300 m. , located, somewhat unpromisingly in the Thar Desert of Rajasthan State. The species was found here in 1888 by a George King. He gave no more details as to the location .So off we went to Mt Abu and explored likely places, mainly the banks of streams, for several days without any success. Two additional problems made our search difficult. The State Forest Department had planted large areas with *R.multiflora*, which led to considerable confusion. The other problem was that, in the language of this area, Hindi, all roses are referred to as 'gulab' which refers to a pink rose, and we were looking for a white rose. Ultimately, we did what we should have done

earlier- travelling around the forest with a local farmer, whom we met on the way and whom we persuaded to accompany us. Our somewhat reluctant guide proved to be much more knowledgeable than at first sight. He led us to some agricultural fields next to a lake, and lo and behold, the boundaries of the fields were planted with hedges of our rose. There were even a few blooms to confirm the identification, though it was well past the main flowering period – it was mid-winter. There were many other bushes of the rose next to the lake margin and we were able to collect a few, as well as take photographs of the flowers. These were borne in corymbs, unlike the usual solitary flowers of the other two forms. But why does this form prefer slightly cooler habitat? We later read the observation of the noted Belgian taxonomist of the 19th century, M. Francois Crepin, who felt that this variant, also called *R. lyelli*, was probably a hybrid with R.*moschata.*

The search for *R.gigantea*

Securing plant material of *R.gigantea* was even more complicated. All that we knew was that the species was available at the very end of the Eastern Himalayas, with a concentration of occurrence in the mountains of Manipur State, in North East India.

A visit to the Botanical Survey of India's Herbarium in Kolkata in 1990, gave us a clue. One of the original specimens collected by Sir George Watt in 1882 was available in the herbarium. A further clue came when we, accidentally, met a scientist who had worked in Manipur, on the steps of the BSI office. In fact we were leaving, and by sheer chance we were accompanied by the Director of this government institution. Seeing us in the company of the latter, the scientist was more forthcoming than he had been when we had written to him earlier, requesting for information on this species. He told us it was to be found on the lower slopes of Mt. Sirohi, which rises to about 5000m., beyond the town of Ukhrul. Reaching Ukhrul involved a long arduous and cold drive, as it is on the border with Myamnar (Burma) at an altitude of 1200m.

Tribals stopped us on the way to ascertain that we were not looking for the endangered and protected Sirohi Lily (*Lilium mackliniae*). From Ukhrul we went by jeep to Mt Sirohi and on the mountain track leading to the top, we walked for a few kms. And then, to our delight, we found huge climbing bushes of the rose. It was peak winter and dew lay frozen on the ground. Our excitement equalled that of the explorer/ botanist, Frank Kingdon Ward, who has described his encounter with this rose on the same mountain:

'One of the most amazing sights was a huge scrambling rose, which sprawled determinedly over the trees in every lane and copse. The largest specimen we saw had what I can only describe as a trunk, as thick as a man's forearm, from which sprang several stems, each more than a hundred feet long and all heavily armed with strong flat prickles'. After the stems pierced the top of the forest canopy, he observes *'Now that it had come through the roof into the open, it greeted the sunshine by hanging out banners of flowers on every side. The chubby leaves, still soft and limp, were a deep red; the slim pointed flower buds a pale daffodil yellow; but when the enormous flowers opened, they were ivory white, borne singly all along the arching sprays, each petal faintly engraved with a network of veins like a watermark. The shock of orange capped stamens made a perfect centre-piece, and the flower distilled a delicate fragrance. What a sight was this great dog rose throughout March, lording it over the thickets, festooning the tallest trees, and hanging from every limb in cascade of scented flowers the size of tea cups…the globose hips look like crab apples. They are yellow with rosy cheeks when ripe.'*

Fortunately for us, there were a large number of the previous year's hips, though no flowers. We collected some, as well as many cuttings, and returned feeling exhilarated. Only one of the more than hundred cuttings sprouted, but the seeds produced many seedlings.And thus started our work with plants of *R. gigantea,* which first flowered in 1994, in our mountain home in Kodaikanal.

We now come to the various stages by which the garden roses were evolved starting from the original wild species.

Taking up *R.clinophylla* first, we would like to point out that genetically this species is very far removed from the modern garden rose. There is also the problem that *R.clinophylla* is a diploid and modern roses are tetraploid. Its only close relative is *R.bracteata*, which is a species of Myanmar and Southern China though well established in several places in India.

Two different approaches were adopted in this program. The first of these involved crosses with the well known Tea rose, 'Mrs. B.R.Cant' which does very well even in the warm areas of India. The second was utilizing the floribunda 'Little Darling', a tetraploid which was extensively used by the great breeder, Ralph Moore, in his crosses with different roses, giving a clear indication that it was responsive to unusual pollen.

Taking up breeding with 'Mrs B. R. Cant' first, it proved extremely difficult to get viable seed from the cross ['Mrs B R Cant' x *R.clinophylla* (Chota Nagpur form)] – out of over 200 pollinations , less than 50 seeds were obtained, of which only two germinated. The first promptly perished, but we were lucky with the second one— initially rather weak, it however survived to produce single pink flowers which, surprisingly, repeated. A back cross into 'Mrs B.R.Cant' again resulted in a much more vigorous and fertile plant of the Tea rose persuasion in dark pink with semi-double flowers. This seedling, nicknamed 'Pink-Pink' figures in our various crosses at the diploid level.

Work with 'Little Darling' was somewhat easier. We did not use *R.clinophylla* itself but a more vigorous hybrid of *R.clinophylla* and *R. bracteata*. The logic of this was that while as we mentioned earlier, *clinophylla* occupies a very moist habitat, *bracteata* prefers drier locations, so we felt that the hybrid seedling would be more adaptable to garden conditions. A large number of crosses were raised quite easily since the two species are closely related. We chose a very vigorous seedling which appeared to be half-way between

the two parent species as our pollen parent for breeding with 'Little Darling', and from the resultant plants one appeared to have some promise, though rather weak, with pinky orange flowers but repeat blooming.

We will take up our work using this seedling with 'Little Darling' first, as the program was easier. The first step was to cross this into a well known H.T.' Montezuma', which is well adapted to the Indian heat. From the cross came a fairly double orange rose, reasonably fertile and vigorous, code-named 'Virmont', and this was the starting point for a range of garden roses along with some similar seedlings, such as a cross between 'Arthur Bell' (yellow floribunda) and the 'Little Darling' derivative, (in an effort to introduce yellow colour), as well as a straight cross with the dwarf shrub 'Bonica'. 'Bonica' has, as many of you know, several evergreen roses in its parentage and was introduced in to our breeding line in the hope that evergreen roses would result.

In this background two hybrids were introduced in 2005 – 'Ganges Mist' which is a vigorous fully double white flowered pillar rose with large flowers in the old rose form; and a white to creamy pink shrub 'Silver Dawn', result of inter-crosssing 'Bonica', *clinophylla* and the van Fleet climber 'Silver Moon'. 'Silver Moon' was used in the hope that *R. laevigata* genes figured, as was thought, in its parentage. Unfortunately DNA analysis has shown that 'Silver Moon' has no *laevigat*a genes.

The best of this series so far is the repeat flowering shrub 'Pat Henry' ('Narender' in India), resulting from a cross involving the yellow H.T. 'Landora' ('SunBlest' in the U.S) with 'Virmont' and 'Ganges Mist'. 'Pat Henry' is a healthy plant bearing very fragrant flowers in shades of pink with hints of salmon orange. The flower which has H.T. form at bud stage, opens to old rose form. We speculate that the distinctive fragrance of this rose is the gift of *R.clinophylla*. Under Mrs. Pat Henry's care (she is the proprietor of the well known U.S. rose nursery Roses Unlimited)the rose sported

to a shrub with orange yellow flowers, which she has requested to be called 'Stan Henry'. There are many other roses in the pipeline but we do face a problem in testing for heat resistance, and more will be introduced once this is sorted out.

Coming to the *clinophylla* line starting from 'Pink –Pink', an interesting result has been the appearance of several comparatively dwarf growing roses but with flowers of almost Tea rose size, arising from the cross with the Noisette, 'Reve d'Or', which does well in India. The first to be released from this group is 'Ganges Nymph', which has flowers of a very unusual form, reminiscent of *R.chinensis serratipetala*. The flowers have a very prominent green eye, which is attractive or not, according to taste.

Two other approaches in *clinophylla* breeding have also been tried. The first is to use a complex heat resistant seedling, which has the genes of 'Bonica' and some Tea roses as the seed parent, with 'Pink-Pink'. One result has been a dwarf healthy shrub which flowers freely in shades of pink with a white eye. The second approach is to use a species hybrid seedling of *clinophylla* x *gigantea* with other roses. One interesting result is a cross with 'Mrs B.R.Cant'. A further cross of this with the found China rose, 'Telengana Pink' has led to an elegant H.T. form climber which will be the basis of further work.

Work with *R.gigantea* has been somewhat easier as genes of this species are present in garden roses though perhaps remotely. Two types of crosses have been used. The first is crosses of *R. gigantea* with 'Reve d'Or' mentioned earlier as doing well in India. The second is a cross of *R gigantea* into the orange red H.T.'Carmosine', which is well adapted to Indian conditions.

Early on we understood the unanticipated bonus of using *R. gigantea* in breeding – the H.T. form so loved by the majority of rose growers is the gift of this species. Crosses with 'Reve d'Or' were unexpectedly successful as several climbers could

be raised. These were generally once flowering though as the varieties matured some of them did repeat. One of the most interesting results was 'Amber Cloud' with real amber coloured buds and single flowers in cooler weather, and creamy yellow when it got hot. One of our friends wanted this rose to be called Golden Gigantea. -which gives an idea of how this plant performs. 'Amber Cloud' has been admired both in southern USA and southern Europe. Another important seedling with the cross with 'Reved'Or' is 'Manipur Magic', a fully double light yellow rose looking uncommonly like 'Marechal Niel' on steroids. This is a vigorous climber with lovely bronzy green foliage as an added attraction.

Two sister seedlings with double flowers, one creamy yellow with a much darker yellow base and the other, ivory, were named 'Sir George Watt' and 'Sir Henry Collett' to honour the two plant explorers who discovered *R. gigantea* in Manipur and Myanmar.

Coming to the crosses with 'Carmosine' we were lucky that the lovely broad petals of this rose were inherited by the crosses. One of the most charming, with beautiful H.T. form flowers in shades approaching the colour of 'Lady Hillingdon' was named 'Maebara's Dream', as a token of our appreciation for the great encouragement we had received from Katsuhiko Maebara, the guiding spirit behind the Sakura Heritage Rose Garden near Tokyo, Japan.

A second seedling with very large H.T. form flowers in apricot yellow to creamy yellow was introduced as 'Evergreen Gene' to honour our friend Gene Waering of USA who does so much to popularize the idea of evergreen roses for warm climates.

The third of the series is a spectacular yellow and pink climber called 'Frank Kingdon Ward' after the great plant explorer who rediscovered *R. gigantea* in the mountains of Manipur.

Meanwhile, we made the interesting observation that the well known rose 'Carefree Beauty', bred by Griffith Buck of

the U.S. for cold hardy climates, had, additionally, the quality of being well adapted to heat. A cross of 'Carefree Beauty' with 'Maebara's Dream' produced the shocking pink, repeat flowering H.T. form shrub with comparatively restrained growth for a gigantea (only around 5 feet) named 'Naga Belle', named for the Naga tribe of Manipur area. A similar cross of 'Carefree Beauty' and 'Evergreen Gene' led to 'Allegory of Spring' with delicately beautiful H.T. form flowers in shell pink opening to old rose form, again repeat flowering.

The use of the floribunda 'Brown Velvet' with 'Maebara's Dream' produced 'Sirohi Sunrise' a pillar rose with browny orange blooms, which in turn crossed with 'Golden Showers' led to 'Golden Threshold', a compelling shade of dark yellow with anthers of brown verging on chrysanthemum crimson. This climber performs well in many parts of the world. I show you a photograph taken in Serbia.

Used in further crosses 'Golden Threshold' is yielding a range of shrub roses in eye catching colours. Many other hybrid *giganteas* using different combinations of modern roses with our *gigantea* strains are in the pipeline.

As many of you are aware, the Tea roses are closely connected with *R.gigantea* and it is no surprise that several new Tea roses have been hybridized arising from the same type of crosses. One of them is 'Faith Whittlesey' which does well in warm climates, another is the shell pink with a hint of apricot 'Lotus Born'. 'Aussie Sixer', apricot yellow has been named in honour of the six Australian ladies who have written the new classic book on Tea roses.

In conclusion we would like to reiterate that it is perfectly possible to start from a rose species and create garden roses in a reasonable span of time. We mention this in the hope that younger rose breeders will take up the challenge of creating new roses, by enlarging the genetic base of the modern garden rose so essential if the rose is to remain the world's favourite flower.

R.clinophylla habitat

R.clinophylla

Ganges Mist

"PinkPink"

Reved'or x "PinkPink"

"Landmont"

Narender/Pat Henry

R.gigantea habitat

Golden Threshold

R.gigantea

Amber Cloud

Maebara's Dream

Allegory of Spring

Manipur Magic

Vishnupriya/Helga's Quest

Rose Research in India

Dr. T. Janakiram

The rose is universally acclaimed as the "**Queen of flowers**" and genus *Rosa*, which belongs to the Rosaceae family, includes around 200 species and more than 18,000cultivars. The plant has a wide range of adaptability to various soil and climatic conditions. It has a long blooming period and its flowers are beautiful with good shelf life. In India, the rose has been grown for a long period and is considered the principal cut flower crop, grown both in open and under protected environments. Rose petals are used as medicament in Ayurveda and for the extraction of highly prized essential oil used in the perfumery industry. In flower markets mainly Hybrid Tea (H.T), Floribunda and the Spray types are in demand for production of quality roses. Rose breeding started nearly a century and a quarter ago and first HT rose "La France" was developed by Guillot in France in 1867. There are about 120 recognized and described species of roses which range across the temperate regions of the north hemisphere from the Pacific coast of North America, Europe, Africa and Asia.

1. Rose Breeding in India

Breeding of rose varieties made a late start in India and the earliest mentioned Indian raised variety seems to one named "Dr. S.D. Mukherjee" introduced by B.K. Roychoudhary in 1935. The first phase of rose breeding in India was dominated by B.S. Bhatcharji, head of the well known rose nursery at Deogarh (on the border of Bengal and Bihar) who raised a very large number of varieties between 1941 when the first one, 'Ramakrishna Dev' was introduced, and 1968. The main objective of his work was to raise new

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varieties for the tropics. S. P. Banerji also apparently raised some varieties in the '1950's and '60's.

1.1 Breeding by nurserymen and amateurs

Many amateur rose breeders (some with little scientific education) had been obsessed by the urge to create new varieties. B.K. Roychoudhary, a nurseryman from West Bengal was the first Indian rose breeder to develop a cultivar 'Dr. S.D. Mukherjee' in 1935. Scientific rose breeding was started in early sixties by Dr. B.P. Pal, then Director, IARI, New Delhi who evolved 105 varieties. He was the first amateur to take up rose breeding as a hobby, as his main work in the field of agricultural science was the breeding of disease resistance strains of important crop plants. He started with open pollinated seeds of the well-known 'Gruss an Teplitz', bred by Geschwind and introduced by Lambert in 1897. His most elegant creations are 'Dr. M.S. Randhawa', 'Dr. Homi Bhabha' among HT types, and 'Banjaran' and 'Delhi Princess' among floribundas.

Among other nurseries which have also entered the arena of rose breeding, mention may be made of Anand Roses at Jaipur where Mrs. P.L. Airun had success with her very first seedling, 'Golden Rays', selected from a cross between 'Whisky Mac' x 'Duet', and Friends Rosery at Lucknow, where J.P. Agarwal introduced a beautiful rose named 'Kasturirangan' in the lilac-lavender group. Laveena Roses at Meerut released several roses, as did Doon Valley Roses at Dehra Dun in the Himalayan foothills. Arpi Thakur bred the Hybrid Tea 'Ajanta' (mauve with greenish shading at the base of the petals). R.R. Karnad and his associates at the TISCO Nursery at Jamshedpur in Bihar were also active. The dynamic Raja Surendra Singh of Nalagarh, who belonged to the princely class, and who became the President of the Rose Society of India, took to growing and breeding of roses. His two best known creations were the satin-pink 'Nazr-e-nazr' and the lilac-mauve 'Yamini Krishnamoorthy'. From 1966 M.S.Viraraghavan started rose breeding with an objective of

evolving a long lasting petal texture to cope with the scorching sun. Hybrid Tea cultivars bred by him are 'Kanchi', 'Vanamali', 'Nefertiti' and 'Priyatama'. In the '70's, two more rose breeders who achieved success were Y.K. Hande who bred 'Ajantha Caves', 'Indian Pearl' and 'Lokmanya', and Braham Dutt, who bred 'K.K. Thakur' (apricot) and 'Pride of Nagpur' (dusky red).

1.1. Milestones in rose research in India

- Earliest mention of Indian raised varieties relates to the one named 'Dr. S. D. Mukerjee introduced by B.K.Roychodhury in 1935.
- First phase of rose breeding in India was dominated by B.S. Bhatcharji
- The famous plant nursery KSG Son, Bangalore made a strong entry in the field of rose breeding. Some creations by him are Hybrid Teas 'Srinivasa' (Red and White bicolour) and 'City of Panjim' (Pink and off White bicolour)
- The other nurseries which have also entered the arena of rose breeding are Anand Roses (Jaipur)
- In recognition of the contribution made by Indian Agricultural Research Institute in rose breeding, The Department of Posts, Government of India has portrayed 3 IARI varieties viz., 'Delhi Princess', 'Jawahar' and 'Bhim' in unique postal stamps impregnated with fragrance.
- Research on rose improvement was initiated at the Indian Agricultural Research Institute, New Delhi in 1956.The work started with the organization of a National Rose Collection at the Institute.
- Two rose varieties namely 'Rose Sherbet' and 'Delhi Pink Pearl' were evolved for the first time by Dr. B. P. Pal in 1962.

- Indian grown roses were exported in 1969 to USA, in collaboration with State Trading Corporation.
- 'Mohini', a chocolate brown coloured aneuploid rose variety was released during 1970.
- Some of the varieties like 'Banjaran' received good reports from the USA and were awarded first and second prizes in Rose Shows held there.
- DUS testing of roses was initiated at IARI in 2002.

1.2. Crop Improvement

The main thrust in improvement has been on breeding new varieties of roses, suited to the tropical Indian conditions for garden display, as well as for cut flowers. The main objectives of rose breeding are to evolve varieties with attractive flower colour, form, fragrance, floriferousness, disease and insect-pest resistance and their suitability for growing under sub-tropical conditions. Experience gained through numerous basic studies conducted at IARI, suggested the possibility of such breeding for desired objectives. With the approaches of genic manipulation, chromosome engineering using aneuploidy and induced mutations, much success has been achieved in the improvement of roses.

As plant breeding has evolved over the last centuries into a science rather than art, and plant production has become an industrial process, the focus has changed to plant production parameters rather than flower fragrance. This became even more pronounced after the concept was introduced that the flower fragrance may have a negative correlation with the vase life of cut roses. In case of roses this has led to the development of many beautiful roses in terms of flower colour and shape with enhanced vase life but with less fragrance than earlier cultivars and wild species. Rose flowers provide one of the most important essential oils which are indispensable in perfumery production.

1.3. Genetic Resources

Genetic conservation is most important and special thrust must be given to *ex situ* conservation which comprises field gene bank, seed storage, pollen storage, *in vitro* culture bank and cryopreservation. All India Coordinated Floriculture Improvement Project, New Delhi contributed to documentation and conservation of genetic resources. A comprehensive germplasm collection of over two thousand rose varieties and species during the twenty five years, called the National Rose Collection, provided the best material for rose breeding. This includes hybrid tea, floribunda, polyantha, miniature, climbing roses and several *Rosa* species introduced from abroad through National Bureau of Plant Genetic Resources, New Delhi and other sources within the country. The experience gained with the assessment of the germplasm indicated that some of the famous roses, namely 'Super Star', 'Queen Elizabeth' and 'First Prize' introduced from abroad performed well under Indian conditions.

1.3.1. Rose Species

In India, a total of 25 species in the genus *Rosa* have been reported to grow in the wild. Eight of these have contributed to the development of modern ornamentals in the group 'Hybrid Teas'. The use of wild roses for various purposes with special emphasis on the use of the fruits (rose hips) *e.g.* as food, animal feed and for therapeutic applications was studied. Distribution of all *Rosa* species available in India was mapped and utility and potential of these species was compiled to facilitate collection, conservation and utilization. Of the species occurring in India, *R. centifolia, R. gallica, R. macrophylla, R. gigantea, R. foetida, R. moschata, R. multiflora* and *R. webbiana* have been reported to produce hips that are rich in vitamin C. Therapeutic value has been reported for hips of *R. centifolia* and *R. chinensis*.

1.4. Basic Studies

Studies conducted for the meiosis of garden rose varieties observed that euploid numbers are most frequent and in exceptional cases, aneuploid numbers were also recorded. Inter-varietal variation in chromosome pairing was reflected in varying degrees of expression of univalent, heteromorphic bivalents, bivalents with double secondary constrictions and multivalents. Reports also mentioned supernumerary fragments in addition to the euploid chromosome complement in three varieties and also reported chromosomal numerical mosaics in three floribunda and one hybrid polyantha varieties. A quick and less cumbersome method for obtaining mitotic chromosomes from leaf tips was developed and was found extremely useful as the mitotic chromosomes could then be studied round the year. It was observed that most of the garden rose varieties were tetraploid (4x=28) while some were triploid (3x=21). One variety 'Mohini' is aneuploid with 22 (21+1) chromosomes.

Studies were conducted on a few basic aspects like stigma receptivity, pollen viability, method, time and season of pollination to exploit the limited favorable period for better seed set and seed germination. It was observed that maximum stigma receptivity was 1-2 days after anthesis. While the period of receptivity was longer in winter than spring, the percentage of hips set during winter was lower compared to spring. This was attributed to low mean temperature during this period. Pollination done at 12 o'clock in the day gave the highest hips set. Self-pollination gave higher percentage of hips set than those observed in cross pollination. The best set was, however, found in open pollination. With regard to germination of seed, the normally practiced method of stratification for three months did not prove effective and the best results were obtained when seeds from green hips of 'Delhi Princess' stratified for one month, and in 'Esperanza' from settled seeds (non stratified) and washed seeds (stratified).

It was established that parents for hybridization should be chosen from varieties known to possess high female and high male fertility, such as 'Pink Parfait', 'Swati', 'Sweet Afton', 'Charles Mallerin', 'Crimson Glory', 'Golden Splendor', 'Buccaneer'. Parents having two or more colour combinations in their flowers, when crossed with parents having self-coloured flowers showed that the segregation of flower colour was more variable than when both parents are self coloured. Crosses among whites or yellows thus produced hybrids having flowers like those of parents only. A greenish-white flower variety crossed with a pure white one revealed greenish-white to be dominant. Deep yellow colour was found to be recessive to the light yellow and dark red to shades of pink. Segregation for flower fragrance in hybrids was higher (75%) where both parents, were fragrant as compared to crosses in which only one parent, 'Sweet Afton', 'Avon', 'Charles Mallerin', 'Oklahoma' or 'Prelude', was fragrant. However, some hybrid seedlings had fragrant flowers even in crosses when none of the parents were fragrant, 'Message' x 'Virgo', 'Western Sun' x 'Golden Splendor' and 'Buccaneer' x 'Golden Splendor'. A good rose flower must have sufficient number of petals, the optimum number being 30-50 petals. On crossing two double-flowered cultivars, there is a wide segregation of the number of petals in the hybrid progenies. In almost all the crosses, the percentage of single and semi-doubled flower seedlings was higher than the fully doubled ones.

2. Production Technology

2.1. Root stock studies

The performance of varieties depends to a large extent on the root stock, which must be suitable for local soil and climatic conditions. Twelve rootstocks viz., Manettii (*R. x noisettiana manettii*), odorata (*R. indica odorata and R. indica major*), Pfander (*R. canina*), De La Grifferaie, Dr. Huey, Edouard (*R. x bourboniana*), thornless (IIHR), thornless (IARI), *R. laxa*, *R. rugosa*, Dog rose (*R. canina*) and *R. multiflora* have

been evaluated at IARI, New Delhi. *Rosa indica var. odorata* was standardized as the best rootstock for roses under North Indian conditions. This rootstock is more tolerant to powdery mildew, is quite hardy, tolerant to drought conditions and is highly suitable for saline soils.

3. Contributions of Research Institutes for Rose Research in India

3.1. ICAR- Indian Agricultural Research Institute (IARI), New Delhi

The internationally known Indian Agricultural Research Institute (founded in 1905 with the name Imperial Agricultural Research Institute) has been breeding garden roses since the 1960's; besides employing the ordinary breeding procedures it has also conducted mutation breeding. It is now one of the major rose breeding centers in India.

The Division of Floriculture and Landscaping at the Indian Agricultural Research Institute, New Delhi is known for its enormous contributions in the area of varietal improvement of roses. The work started with the organization of a National Rose Collection at the Institute. The breeding of roses was started from the year 1957, keeping in view the fact that the roses bred under temperate climatic conditions may not perform well like those bred under tropical conditions. As a result of this, 'Rose Sherbet' and 'Delhi Pink Pearl' were evolved by Dr. B. P. Pal in 1962. Dr. B. P. Pal laid the foundation for scientific breeding of roses in the country at IARI. His pioneering efforts yielded 105 rose varieties spanning across hybrid teas, floribundas, polyanthas, climbers and miniatures. The legacy of systematic breeding was then carried forward which led to release of more than 100 varieties. The development of new rose varieties at IARI has created a great deal of interest in rose cultivation in the country. Some of the varieties like 'Banjaran' received good reports from the USA and were awarded first and second prizes in Rose Shows held there.

3.1.1. Germplasm Collection

The division maintains a rich germplasm collection of 350 promising varieties and 14 species Conventional hybridization and mutation breeding were employed for evolving new varieties.

Year	Varieties and Species collected
2009-10	**28 varieties** Perfume de French Comete, Secret, Double Delight, Opening Night, Sheer Bliss, Tahitian Sunset, Timeless, Black Lady, Cherry Parfait, Tequila, Love, Gemini, Victor Hugo, Sea Pearl, International Herald Tribune, Papa Meilland, Kiss, Headliner, Olympiad, Blue Moon, Vintage Wine, Nartaki, Party Glow, Libby, Loving Touch, Debidue, Misty Dawn and Pink Above All
2010-11	**49 varieties** Moon Lace, Fragrant Lace, Dutch Gold, Bora Bora, Scentimental, Midnight Blue, Ena Harkness, Memorial Day, Crimson Glory, Taboo, Mardi Grass, Moon Drops, Velvet Fragrance, Tahitian Sunset, Lemon Sherbet, Perfect Moment, Brides Dream, Atago, Mme. Delbard, Fragrant Plum, Midas Touch, Elle, Fragrant Dream, Sunsation, Double Knockout, Honey Dijon, Marco Polo, Mauve Melody, Liebzaur, Crown Princess Margaret, Tipu's Flame, Siddhartha, Choo Centennial, Viva Zauber, Impatient, Blue River, Masai, Celebrate America, Las Vegas, Taro, Sclia, Interoma, Harkness Marigold, Big John, Touch of Liberty, Harry Wheatcroft, Ingrid Bergman, Rose Hannes, Tiffany.
	14 species *Rosa tomentosa, Rosa dumalis, Rosa rubiginosa, Rosa banksia, Rosa brunonii, Rosa indica major, Rosa bourboniana, Rosa rubrifolia, Rosa multiflora, Rosa agastria, Rosa wichurana, Rosa moschata, Rosa macrophylla and Rosa nitida*

2011-12	**41 varieties**
	Octoberfest, Harmonie, Blue Perfume, Blue Nile, Holstein Perle, Black Magic, Carina, Mullard Jubilee, Marilyn Monroe, Tiffany, Neptune, Grand Masterpiece, Lady Meilland, Friendship, Elizabeth of Glamis, Etoile de Hollande, Virgo, Nigrette, Senataeur Royal, Spartan, Perfecta, White Masterpiece, Tournament of Roses, Sweet Heart, Kardinal, Scarlet Knight, Deep Secret, New Zealand, Royal Highness, Karl Herbst, Kleopatra, Inge Horstmann, Mercedes, Schwarz Madonna, Sophia Loren, Swarthmore, Black Baccara, Confidence, Crimson Bouquet, Andrea Stelzer.

3.1.2. Varietal Improvement

Among success in this field in the Hybrid Teas is the beautiful pink 'Mrinalini', the attractive white 'Jawahar' and the exquisite 'Abhisarika' the last named being a product of the mutation breeding programme. The most recent introduction from the Institute, the pink and white 'Priyadarshini', has attracted much notice. However, the greatest impact of the Institute so far has been in the Floribundas, where the list of successes includes pink-and-white 'Prema', the deep lavender-lilac 'Neelambari', the white or near-white 'Shabnam', besides 'Suryodaya', 'Shringar' and 'Sindoor' in the orange-scarlet group, and the fabulous 'Mohini', whose flowers are deep brown in cold weather. One should also point out 'Sadabahar', its striped mutant, 'Nav Sadabahar', and 'Arunima', which bloom in riotous profusion. The Institute now has on its programme long range objectives like breeding roses specially adapted to tropical conditions, and for incorporating disease resistance into popular garden varieties.

Among floribunda group, 'Mohini' is having an unusual chocolate colour and was only Indian rose patented in US but abandoned later on due to its inconsistent performance.

Mutation breeding

Novel varieties were evolved by mutation breeding. Treating 'Christian Dior', 'Kiss of Fire' and 'Queen Elizabeth' with different doses of gamma rays led to 'Pusa Christina'-(pink coloured induced mutation of Christian Dior), and 'Abhisarika' (a pink striped mutant from 'Kiss of Fire'). Kaicker and Swarup (1978) obtained a mutant 'Madhosh' from 'Gulzar' by use of EMS (0.25% for 8 hours) treatment of bud wood and then budding on rootstock.

3.1.3. Varieties being used in breeding programme

Cut flower

First Red, Folklore, Grand Gala, Montreal, Christian Dior, American Heritage, Angelique, Arjun, Black Lady, Borolina, Command Performance, Confidence, Crimson Glory, Crown Princess Margaret, Doris Tystermann, Double Delight, Dr. B. P. Pal, Dutch Gold, Ena Harkness, First Prize, Friendship, Gladiator, Gold Medal, Golden Giant, Granada, Grand Mogul, Happiness, Hollywood, Inge Horstmann, Ingrid Bergman, John F. Kennedy, June Bride, Kardinal, Karen Blixen, Konrad Henkel, Lady X, Love, Louisiana, Lynn Anderson, Maid of Honor, Marco Polo, Mercedes, Nehru Centenary, Nigrette, Opening Night, Paradise, Pasadena, Pristine, Pusa Arun, Pusa Bahadur, Queen Elizabeth, Raja Surendra Singh of Nalagarh, Raktagandha, Spartan, Super Star, Tiffany, White Queen Elizabeth, Victor Hugo.

Fragrance

Rose Sherbet, Sugandha, Bonne Nuit, Christian Dior, Anurag, Blue Moon,Blue Perfume, Brandy, Century Two, Eiffel Tower, Elle, Fragrant Dream, Fragrant Lace, Fragrant Plum, Haseena, Jadis, Jawahar, Karen Blixen, Melody Perfume, Midas Touch, Memorial Day, Mister Lincoln, Nurjehan, Oklahoma, Papa Meilland, Perfume de French Comete, Raktima, St. Patrick, Sweet Afton, Velvet Fragrance, *Rosa damascena*.

Garden Display

Africa Star, Andorra, Pusa Baramasi, Bewitched, Blithe Spirit, Brilliant Light, Carmosine, Charisma, Charleston, Chingari, Crimson Glory, Deepak, Delhi Princess, Dr. Bharat Ram, Dr. M. S. Randhawa, Ganga, Gemini, Gene Boerner, Homage, Hot Cocoa, Iceberg, Imperator, Jacaranda, Jawani, Jogan, Kiss of Fire, Krishna, Lady Meilland, Lalima, Lemon Sherbet, Loree, Madam Delbard, Maharani, Manmatha, Mardi Gras, McGredy's Sunset, Michelle Meilland, Modern Art, Mrinalini, Navneet, Neelambari, Pinata, Pink Montezuma, Prema, Preyasi, Pink Parfait, Priyadarshini, Pusa Abhishek, Pusa Ajay, Pusa Garima, Pusa Gaurav, Pusa Komal, Pusa Muskan, Pusa Pitamber, Pusa Veerangana, Summer Holiday, Sonia Meilland, Sadabahar, Sea Pearl, Summer Snow, Surkhab, Suryakiran, Taj Mahal, Viamala, Woods of Windsor.

Table 1: Popular varieties evolved by IARI which are suitable for different purposes

Purpose	Varieties
Cut flower	Arjun, Raktagandha, Pusa Bahadur, Pusa Arun, Nehru Centenary
Garden display	Arunima, Banjaran, Chingari, Delhi Princess, Dr. S. S. Bhatnagar, Jantar Mantar, Dr. Bharat Ram, Ganga, Lahar, Loree, Madhura, Mother Teresa, Mridula, Mrinalini, Mohini, Manmatha, Neelambari, Prema, Preyasi, Priyadarshini, Sadabahar, Suryakiran, Pusa Baramasi, Pusa Muskan, Pusa Gaurav, Pusa Urmil, Pusa Virangana, Sadabahar, Pusa Ajay, Chitra, Raktima
Climbers	Delhi White Pearl and Delhi Pink Pearl
Fragrance	Rose Sherbet, Raktima, Anurag, Jawahar
	Pusa Mohit and Pusa Komal

Some promising varieties

Rose Sherbet

A seedling of well-known rose 'Gruss an Teplitz'. It is free flowering and produces large number of flowers in small clusters. The variety is deep pink, scented and stands up to cold nights in winter. This is suitable for mass planting and for rose hedges.

Mohini (Unique chocolate coloured variety)

A cluster flowered hypertriploid (2n=22 or 21+1) or trisomic which has characteristics of Wichuraina like glossy green leaves has been obtained by crossing Sea Pearl (4x) and Shola(2x), while its sister seedling 'Prema' is a triploid. The additive gene action of the additional chromosome is responsible for the chocolate brown colour.

Pusa Ranjana

A floribunda type hybrid seedling of 'Pink Parfait' and Iceberg which produces dwarf and compact bushes having novel type of growth habit, long lasting dark pink flowers borne in clusters. Plants are vigorous with bright green foliage, good for pot and bedding purpose.

Sugandha

A HT variety developed by Bhattacharji in 1964. Long and bold buds, ranging from pure red to scarlet open into large, loose flowers and gloriously scented.

Nurjehan

A HT variety developed at IARI in 1980. Rose Bengal coloured well-formed blooms of very large size and high centre are borne singly on medium and strong shoots. Highly fragrant. Medium spreading bush.

Raktagandha

A hybrid seedling of 'Christian Dior' × seedling of 'Carrousel'. It has shining red, orange pointed buds opening

to large high centered flowers. The flowers are tolerant to winter injury and are slightly fragrant.

Arunima

Seedling of 'Frolic'. Deep pink flowers are produced in small bunches which are long lasting ; very compact bushes need low maintenance for overall growth.

Himangini

A seedling of 'Saratoga'. Ivory white, medium sized flowers are produced in huge trusses. Plants get covered with a mass of white flowers of very long lasting quality. It has recurrent flowering.

3.1.4. DUS Testing

IARI is one of the National Test Centers of Protection of Plant Varieties and Farmers' Rights Authority (PPV&FRA), Government of India for DUS testing of rose. The test guidelines were formulated for DUS (Distictiveness, Uniformity and Stability) testing of roses. Rose varieties have been characterized as per the new guidelines and the digitalization of the data was completed. Based on the data generated the example varieties have been finalized for a majority of the characteristics. A digital library of all the characteristics is created and a digital image data base is created.

3.2. ICAR- Indian Institute of Horticultural Research (IIHR), Bengaluru, Karnataka

The institute is identified as national repository for roses and also one of the National Test Centers for DUS testing of rose supported Protection of Plant Varieties and Farmers' Rights Authority (PPV&FRA), Government of India. Some of the promising varieties developed by the institute include '**Dr. G. S. Randhawa'** and '**Kiran'** (Hybrid Teas). Recently the institute has also developed '**ArkaParimala'** which is highly fragrant. The institute has taken initiative in breeding roses suitable for protected cultivation and one such variety

developed is '**Arka Swadesh'**. This variety produces shining foliage and flowers of attractive red color. Flower production starts 6 months onwards from planting. High yielding capacity of 145 flower stalks/sq.mt/year. Long stalk flowers with an average stalk length of 65-70cm. Medium sized flowers are produced with good keeping quality (6 days).

Table 3: Genetic stock developed at IIHR

Genetic Stocks	Character	Identification number	Registration number
1.IIHRRs-1	Resistance to powdery mildew	IC567489	ING No. 09049
2.IIHRRs-2	Thornless and resistant to powdery mildew	IC567490	INGR No. 09050
3. IIHRP-13	Resistance to thrips, red colored flower with fragrance	IC574579	INGR No. 10072
4. IIHRP 2-28-1	Bicolor flower consisting vermilion red shading towards orient pink with dark green foliage	IC0584135	INGR No. 10070
5. IIHRP 3-18-2	Long straight flower stalk and less thorns	IC0584136	INGR No. 10071

3.3. CSIR- National Botanical Research Institute (NBRI), Lucknow, Uttar Pradesh

NBRI Lucknow developed 10 HT roses —Kronenberg, Light Pink Prize, 'Mrinalini Light Pink Mutant', Mrinalini Stripe', 'Pink Montezuma', 'Salmon Beauty', 'Summer Holiday Mutant', 'Winter Holiday Mutant',' Sylvia White' and 'Girija' besides 11 Floribunda rosés, *viz*., 'Angara', 'Curio', 'Pink Contempo', 'Pink Imperator', 'Salmon Beauty Mutant', 'Sharada', 'Sukumari', 'Tangerine Contempo', 'Twinkle', 'Yellow Contempo' and 'Zorina Pink Mutant', one Miniature 'Windy City Mutant'; and one climbing rose 'Clg. Cri Cri'.

3.4. CSIR- Institute of Himalayan Bioresource Technology (IHBT), Palampur, Himachal Pradesh

The Division of Floriculture, developed the country's first thornless rose variety '**Himalayan Wonder'** for protected cultivation. The institute standardized the production and processing technologies of aromatic roses and released five varieties of *Rosa damascena*, namely, 'Indica',' Jwala', 'Super Jwala', 'Himroz' and 'Hot Himroz'. Wild strains of rose species collected from Himachal Pradesh were evaluated for their seed oil contents and quality of the oil for the selection of better rose seeds oil producing strains. The range of percent seed oil recovery from different strains was varied from 1.3 to 9.9 percent. Rose seed oil of some of the strains having better food values. CSIR-IHBT standardized the rose plants multiplication protocol through in vitro. Cytological studies in four strains of wild roses belonging to *Rosa brunonii, R. alba, R. cathayensis and R. multiflora* were characterized cytologically. All the indigenous strains of roses were observed to be diploid with a chromosome count of 2n = 14. These rose strains are very vigorous in growth, exhibit winter activeness. Institute registered the four germplasm like IHBT-WR-24 (INGR 08066/IC549905), IHBT- WR-16 (INGR 08067/IC549906), IHBT- WR-23 (INGR 08068/IC549907) and IHBT-WR-21 (INGR 08069/IC549908) in NBPGR, New Delhi. CSIR-Central Institute of Medicinal and Aromatic Plants (CIMAP) Lucknow developed high oil bearing aromatic rose variety 'Noorjahan'. It yields 25-30 q/ha flowers in plains, however in temperate region flower is 40-45 q/ha and oil produced 600-800g and 1 to 1.5 kg/ha respectively.

Strategies for breeding

1. Strengthening germplasm with promising varieties and species.
2. Bulk crosses among varieties suitable for cut flower.
3. Evaluation of promising seedlings and existing varieties under poly house conditions.

Future Focus on Rose Research

- To develop varieties for cut flower production under open and protected conditions.
- To develop varieties for loose flower production.
- To develop varieties for fragrance and garden display.
- To develop varieties for making value added products.
- To breed varieties for biotic and abiotic stress.

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Of what we will a dish of roses to thee
Take a leaf from my rose garden
A flower endures but five or six days
But this rose garden is always delightful

Sa'adi in Gulistan
(The Rose Garden)

Dr. B. P. Pal Rose Garden at IARI, New Delhi

IARI rose varieties in postal stamps

Priyadarshini

Pusa Abhisheik

Indian roses displayed at Indian Rose Show, New Delhi

Pusa Priya

Roses in Laos and China

Prof. Yoshihiro Ueda

Distribution of wild species in China and Japan

The genus *Rosa* is distributed throughout the temperate and subtropical regions of the Northern Hemisphere and comprises more than 150 species. Among these species, 82 taxa are distributed in China (*Flora Reipublicae Popularis Sinicae*, Science Press 1985, Fig. 1.). 53 taxa are distributed in Sichuan province, the greatest distribution area in China. The second largest distribution area is Yunnan province and it may be thought that southwestern China is the original source of the genus *Rosa*. In Japan, on the other hand, there are only about 15 taxa of the genus *Rosa.*

Roses in Xinjiang, northwestern China

Xinjiang is located in northwest China and is famous for the Silk Road. The greater part of the land is an arid region and the province is divided into north and south Xinjiang by the Tianshan mountains. In the south district, there is a famous great desert, the Taklimakan Desert. According to *Flora Reipublicae Popularis Sinicae*, there are 13 taxa of the genus *Rosa* recorded in Xinjiang.

Rosa persica

Among these taxa, *R. persica* Michx. has different characteristics from other wild species: the leaf is simple and without stipules. Therefore, this species is treated by some taxonomists as a different genus, *Hulthemia*. However, the flower of this species is yellow with a deep red or brown center, and an English breeder used this species in his breeding program and raised cultivars with basal blotches (Harkness, 1976). *R. persica* is distributed in the semi-desert

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region of Asia, ranging from Iran and Afganistan in the south through Kazakhstan and north to southwestern Siberia.

In China, according to *Flora Reipublicae Popularis Sinicae*, this species is native only to Xinjiang, and grows in barren land or arid places along roads. In our exploration, this species was distributed from Urumqi to Shawan, about 160 km west, and to Toli, near the Sino-Russian border, and was found growing in fields and along irrigation channels by the roadside. These areas were located about 300 m to 750 m above sea level. There was no distribution of this species in desert places.

The flowering season is May to June and there is a variation in the size of the red blotches of the flowers. The roots grow deeply underground, and the suckers, an important propagating organ, are spread widely. The longest sucker expands more than one meter per year. The large colony expands along irrigation channels around farmlands, because the suckers are cut by plowing.

The soil acidity(pH) is alkaline and about 9.0. The soil contains large amount of calcium.

R. platyacantha

R. platyacantha belongs to section *Pimpinellifoliae* and is distributed in Xinjiang. This species is quite similar to *R. spinosissima* and is differentiated by having broad based thorns.

The distribution of this species in Xinjiang is concentrated in and around the Tianshan mountains and the roses grow on the slopes of mountains and the banks of rivers. These areas were located about 700 m to 2000 m above sea level. The color of flowers is clear yellow with no fading as flowering advances. There is much variation in flower shape and size, and the largest is more than 7 cm in diameter. The flowering season is May to July depending on the height above sea level. In the best flowering season, the scene of yellow flowers with Tien Shan white spruce is really splendid.

The clear yellow color is an important gene resource for reintroducing the color to modern cultivated roses.

R. spinosissima

R. spinosissima also belongs to section *Pimpinellifoliae* and is distributed from Europe to Far East Asia. In Xinjiang, a variety of this species, *R. spinosissima* var. *altaica* is distributed. The name of the variety, *altaica,* is derived from the Altai mountains which are located in the northeast border region between Xinjiang, Russia, and Kazakhstan. This species is differentiated from *R. platyacantha* by having bristles and prickles (thorns) on the stem. Around the Altai Mountains, this species grows on the steep slopes of mountains and along riversides. There are many plants on the slopes of the Altai Mountains overlooking the Lake of Kanas.

Roses in Yunnan, southwestern China

Yunnan province is located in southwestern China. With many high mountains and deep valleys, this province is known for its geographical diversity. The southern part of the province has both tropical and subtropical regions, while the northern part belongs to cool or sub-frigid regions. Such geographical and climatic diversity has made the province a suitable home for various kinds of plant resources. Known as the "Kingdom of Plants", Yunnan province has long drawn the attention of western botanists. From the late 19th century to the early 20th century, plant hunters from around the world rushed to Yunnan to collect and take back to their home countries some of the province's indigenous plants. These were then developed into many kinds of ornamental plants. Among these plants, roses were also important gene resources to establish modern cultivated varieties. Chinese cultivated roses have played an important part in the history of modern cultivated roses by introducing recurrent flowering, high-centred flower shape and tea fragrance, to European roses from the 18th century to the 19th century.

R. banksiae var. *normalis*

R. banksiae var. *normalis,* belonging to the section *Banksianae,* is distributed from central China to southeast China. In Yunnan province, this species is growing by the roadside from Kunming to Dali and it is like the Japanese wild rose, *R. multiflora,* which grows throughout Japan. This species is a tree climber, and grows as a large rambler with many fragrant white flowers. The flowering season is May.

R. gigantea

R. gigantea is one of the most important species in its role as an ancestral rose in the origin of Chinese cultivated roses. The fragrance of Tea roses owes its origin to this rose, which is named in Chinese, Da Hua Xiangshui Yueji (large-flowered fragrant rose), This species is distributed from Yunnan to Myanmar.

We could only find this species in a few locations, one of which was a slope between a road and a paddy field near Dali. In Shilin (The Stone Forest), a famous sightseeing place, we found a large magnificent tree of this species climbing up a lime stone column about 20 m high. The diameter of its basal trunk was about 30 to 40 cm. This rose was reported in the Royal National Rose Society's Journal, *The Rose* (Christmas, 1995). According to the article, the flowering season is the end of March. In Sanei, between Dali and Lijiang, we found a different type of *R. gigantea* changing flower colour. The flower colour was changing from cream yellow to pale pink.

Ancient Chinese cultivated roses

There are few ancient Chinese cultivated roses in the capital city of Yunnan, especially in old temples which have collected specimens. However, in Lijiang district, there remain some ancient Chinese roses. Among these roses, the most impressive was a pink-flowered climbing rose, found by the roadside, inside a public park and on the fences of farmhouses.

(Afterward, this rose was named 'Lijiang Road Climber by Dr. Martyn Rix). Other Chinese roses found included yellow tea roses, a rose similar to camellias noted by Dr. Rix.

Roses in Laos

Laos is located in the central part of the Indo-Chinese Peninsula and the greater part of its land is mountainous. The north part of the country is adjacent to Yunnan province, China.

Why did we go to Laos? The reason that we went there is the result of reading a book about roses written by Dr. Ohba (*The Birth of Roses*. 1997). According to the book, some Chinese roses remain in Laos, because the author discovered some specimens of Chinese roses collected in Laos, in the herbariums of the Paris Museum, Kew Gardens and the Nattural History Museum. On the basis of these facts, we went to Laos to explore these roses of Chinese origin.

Ancient Chinese roses

At first, we visited Paxon in the center of Bolovens Plateau (southern Laos). In some towns around Paxon, we found roses of three types, large shrubs with pale pink medium-size flowers, medium-size shrubs with small red flowers, and large shrubs with pink medium-size flowers. I thought that the large shrubs with pale pink medium-size flowers were Hume's Blush Tea-scented China, because the flower color and flower shape is similar to the description of that rose. The flower changes its shape from a high-pointed bud to a cup shaped flower. This rose was growing in the garden of a farmhouse, covering the roof.

The shrubs with small red flowers were planted in many of the farmhouses of Bolovens Plateau. Among them, there were some clones changing flower colour from pink to red.

The large shrubs with pink flowers were tall slender shrubs. The flower color was pinkish red. After our DNA

sequence analysis, this rose was found to be closely related to *R. chinensis* 'Semperflorens'.

After the exploration in Bolovens Plateau, we went to Sam Neua through Xien Khuang. Around the Xien Khuang area, we observed not only the same shrubs with small red flowers seen in Bolovens Plateau, but also 'Old Blush'.

Wild species rose

According to *the Flora of Laos*, there are only 4 species distributed in Laos. We found one species rose in an area opened by road construction in Bolovens Plateau. The plant was a large shrub with many white flowers emitting a musk-like fragrance. I think that the rose is *R. tunquinensis*, which is one of the species distributed in the southernmost part of south-east Asia.

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Map of Laos

TYPE-1

Ancient Chinese rose in a town around Paxon of Laos

From bud to full-opened flower

'Hume's Blush Tea-scented China' depicted by Redoute

TYPE-2

China roses in Laos

TYPE-3

China rose closely related to *Rosa chinensis 'Semperflorens'*

'Old Blush' in Laos

Rosa tunquinensis native to Laos

Wild Roses and Rose Industry in Iran

Prof. Yoshihiro Ueda

Iran is the original place of oil-yielding roses and the roses were cultivated in the mountains of southern Persia (Iran) for religious ceremonies in B.C. 12 century.

I visited Iran in 2010 to see rose oil and rose water productioin

The national flower of Iran is the roses and I could see roses in various places during my stay in Iran.

Wild Roses

In Iran, there are about 14 species of genus Rosa reported. Among them, *Rosa persica* is one of the most famous species and recently, the breeding using *R. persica* or the persica hybrids has been becoming popular. We went out into the field to observe wild plants located 300km west from Mashhad. During the observation, I found *R. persica* and *R. hemisphaerica* (Fig. 4). *R. persica* was grown in the dry slope (Figs. 2, 3).

R. moschata was used as hedge plant and was planted lining a street (Fig. 5).

Rose Industry

Damask rose (*R. damascena* Mill) is widely cultivated throughout Iran and there are many local varieties. A certain Iranian researcher suggests that Iran is a center of diversity of Damask rose and gives us some clues about unknown center of origin of this rose.

Fars province is located southern part of Iran and Shiraz is capital city of Fars.

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Shiraz and surrounding areas have a long history in production of rose water. I visited Meymand near Shiraz, which is a ancient city and one of the famous production areas of rose water and rose oil. In Meymand, I also could see a store specializing in rose water (Fig. 13).

In Darab, there are huge production areas of *R. damascena* (Fig. 9) and the total area in and around Darab is 4000ha. In Fars province including Meymand and Darab, total production area of *R. damascena* is 4500ha.

Low air humidity, bright sunshine, continuous and considerable temperature fluctuations, rather warm winter and ample irrigation are suitable conditions to grow Damask rose. Therefore, the climate of Fars province might have such conditions.

The main product using R. damascena is rose water in Iran. They use it as drinking water, for cosmetics and cooking.

In Iran, Musk rose (*R. moschata*) is also an important rose for extracting rose water and rose oil (Fig. 14).

Thou art in the Ka'ba at Mecca,
As well as in the temple of Somnath.
Thou art in the monastery,
As well as the tavern.

Fig.1. Map of Iran A: The place of field research
B: Meymand C: Darab

Fig. 2. *Rosa persica*

Fig.3. *R. persica* grown in dry slope

Fig.4. *R. hemisphaerica*

Fig. 5. *R. moschata*

Fig. 6. Producion field of Damask rose in Meymand

Fig. 7. The collected flowers in bag

Fig. 8. *R. damascena*

Fig. 9. Production field of Damask rose in Darab
(Photograh by courtesy of Dr. A. Karami of Shiraz University)

Fig. 10. Still for rose oil and water

Fig. 11. Rose oil and rose water

Fig. 12. New-model stills

Fig. 13. Rose water shop in Meymand

Fig. 14. Rose water Left: produced from *R. moschata*, Right: produced from *R. damascena*

Letter from Thailand

Pojana Nagavajara

Dear Mr. Viraraghavan,

Thank you for your letter of October 9th, 2013. First of all, I must tell you that I am no 'rose-expert' and the fact that I am the author of two books on roses does not necessarily mean I grow better roses than others or know more about the subject than my friends!

I started growing roses after I had moved from Bangkok to Chiang Mai in 1982, having early-retired from the State Railway of Thailand the same year and intending to earn a living by growing vegetables, fruit and flowers. Starting with carnations I finally ended up with roses.

At that time, we grew garden roses for cut flowers. But around 1989, commercial cut-roses were brought in and rose farms proliferated. That lasted until around year 2002 when the climate change began to affect the roses. Rose farms on the lowland (i.e. in Chiang Mai and its outlying areas at 300 m.) began to disappear one after the other. The only way to survive was to move up the hills but the lands suitable for agriculture were hard to find. So at present, there are only rose farms on the hills at the altitude of 1,000 m. which can supply quality cut-roses, competing with imported roses from China.

On the garden roses, the situation is more or less the same. Here rose is relatively more difficult to grow successfully than other flowering plants and is even more so now. Serious growers are therefore very few. The majority are rose lovers who eventually give up after two or three years. Many of them are not prepared to use insecticide and after some time get disheartened after the attack of black spots, spider mite

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and thrips. Chiang Mai is considered the leader of rose growing provinces but paradoxically you hardly find a decent public rose garden, either private or governmental. The only rose garden which is well established and well cared is the rose gardens of the Bhubing Palace on the hill (1,400 m) in Chiang Mai. I personally think that it is certainly a public rose garden of international standard.

Having read this far, you may understand why we have no rose society like yours. As far as I know, Malaysia, Indonesia, the Philippines, Vietnam and all the other tropical countries are the same. The only organized body of rose growers is our Chiang Mai Rose Group. We formed the Chiang Mai Rose Growers' Group in 1987 when the rose growing was at its peak with the objectives of disseminating information and growing techniques to growers in general. Now as the rose growing has waned both commercially and as hobbies, the Group face the same situation. We are more or less in the state of trying to sustain our life. Only a few of the members and advisors of the Group's Committee grow roses (of course they used to grow roses). Activities are limited to a few meetings, publication of journals, and the Annual Rose Show. We even had to change the name from Rose Growers Group to Rose Group.

It would not be wrong to say that Thailand is not fit for rose growing. A rose garden here has a life of about 10 years or even shorter. My garden after 20 years is now having a serious problem, the roses in the ground are gradually dying. And as you may well know, the problem of replanting on the same ground has not yet been solved. The only way to continue is to grow them in pots.

To recruit new comers to the Group, we have been trying to find varieties that are easy to grow in this climate of ours. So far, it is confirmed that the damask (Kulab Mon), Cecile Brunner and an unidentified bush bearing small pink-mauve flowers need no care. They may be attacked by black spots,

mildew and all the insects but they will become healthy again in no time.

On the subject of hybridization, as far as I know there are only two active hybridizers in Chiang Mai (maybe in Thailand) i.e. Dr. Wachira Ketpet of the Royal Project, working on commercial cut-flowers and Mr. Niwat Tarupunno of Bhubing Palace, on garden varieties. You will find the names of Chavalit Chinprayoon (var. Star of Thailand 1978) and Dr. Theera Umsawasdi on the list of hybridizers in the book Modern Roses of ARS. I presume that Chavalit is not doing any more hybridizing. The other one, Dr. Theera who many years ago worked in the USA produced quite a few varieties, so successfully that Certified Roses Inc. introduced some of them in the US. Market (Always Love You, 2000, Our Little Secret, 2002). He is now back in Thailand working in a private hospital in Bangkok but I doubt if he is doing any hybridizing now.

I am always impressed with what rose growers and hybridizers have done in India. When I first started to grow roses, among the books I consulted was a book called The Rose in India by B.P. Pal, 1972 Edition. It would be very interesting indeed to attend the Conference in 2014 in India, were I little younger. As I am now 85 and do not make a long travel any more, I am very sorry to have to decline your kind invitation. However, the Royal Project with which Dr. Wachira is working might be interested to participate, especially in the subject of hybridization. You may contact Dr. Wachira Ketpet **(wachiraketpet @hotmail.co.th)** and find out if there is a possibility.

I'll let him know of my suggestion.

I hope you will understand the situation. I am glad that I have had the honour of being in contact with you and we will be able to exchange information and views on roses. You can contact me on the e-mail via my daughter : aednaiyana@gmail.com

I come to see her every Tuesday from where I live, which is 48 km. north of Chiang Mai.

Yours sincerely,

Pojana Nagavajara

Editors Note: Mr. Nagavajara is called 'The Father of Roses' in Thailand. He has written many books and articles on roses. We would have been delighted if he could have come for the rose conference, unfortunately his age and frail health denies us that pleasure.

Thou art at the same time the light and the moth,
The wine and the cup,
The sage and the fool,
The friend and the stranger,
The rose and the nightingale.

Prince Dara Shikoh in
'The Compass of Truth'

Bitter Sweet.... But Loverly Roses in my Garden

Mariam Ahmad (Merille A.Ghazali)

"The **rose** speaks of love silently, in a language known only to the heart."

I adore beautiful roses, and every time I travelled abroad I have never failed to take time to visit rose gardens whenever I have the opportunity, but I was sceptical about growing them because time and again I have heard friends who are growing roses complain about the difficulties of growing them. However, a back injury that impeded me from playing any games or doing vigorous exercises and a sudden craze for rose growing among Malaysians which started around 2010 motivated me to grow roses. Nonetheless, I didn't take the plunge until late 2012. I guess rose growing has taken me by storm since I am really out of control of my addiction, as I seem to eat and sleep thinking about roses and roses only.

Growing roses in Malaysia is a very challenging hobby. The first problem I encountered was to find the plants to grow. The local nurseries in my area do not sell many rose plants, those that they sell are 'village roses' and roses that were grown in the highlands which experience low temperature, or they were grown under shade. Funny though it may sound, I was not interested to grow the 'village roses' then, because they can easily be found in many places. I was dreaming of growing hybrid tea roses which I have seen in rose gardens that I have visited abroad. Although there was a nursery that sells imported roses in Kuala Lumpur, the booking list was as thick as my Webster dictionary, hence I didn't make any effort to purchase any rose plants from that nursery.

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Since, I am not the type to give up easily and I was intent on growing roses, I coaxed my other half to drive me to Cameron Highlands which is about 400km from Kuala Lumpur to buy some highland roses; however those roses could not withstand the strong sunlight and high temperature of Kuala Lumpur and they only survived perhaps a week or so in my garden. Getting thoroughly desperate and frustrated, I searched the web in the hope of buying rose plants online but nobody wanted to send them to me.

A lucky break of driving behind a small lorry changed my life 360 degrees. I saw that the lorry was carrying many plants and after following it for a few minutes, I saw it signalling to enter a nursery…..and I decided to make a stop, just to check whether there were rose plants in that lorry—yes there were, many grafted rose plants that were about 18 in. tall, and they were actually a consignment for the nursery. However, the nursery owner was unwilling to accept them because the plants did not appear to be healthy. From the little knowledge that I had read about rose growing I suspected that the plants were just undergoing stress and could be revived in a couple of days so I grabbed the opportunity to make an offer and got them at retail price and the fifty rose plants were sent to my house free of transportation charges.

My first task accomplished, and now that I had fifty plants which were certainly not of local variety, my next challenge was, how to care for them and make them bloom beautifully in my garden. My love affair and addiction with roses had just started. I spent the whole night Googling for information on rose care. First thing the next morning, I headed to a nearby nursery to buy pots and composted soil and made the necessary arrangements to get them delivered to my house in the afternoon, then I drove 20 km. to the nearest store looking for fertilisers and pesticides.

Now it's almost two years since that lucky day, and I have added hundreds more rose plants to my collection.

However, the most challenging issue that I face in planting my roses is the climate, which is constantly hot and humid. At certain times of the year, we do experience extreme torrential rain that causes me to lose many plants due to canker and root rot. The continuous and prolonged torrential rain will certainly flood the medium, thus impeding its drainage and shuts out soil aeration. The wet condition also causes black spots and other fungal infections.

The battle to keep the rose plants free of diseases is a desire every rosarian dreams of. However, for me it's a nightmare to keep my plants free of diseases, besides the unpredictable weather in my country, rose diseases are very rampant in our weather. Handling the diseases the organic way is near impossible. I found the solution of using chemicals to handle the problems, but if I miss the regime of spraying I will be faced with blemished blooms that break my heart.

Procuring suitable chemicals to handle rose diseases is yet another drawback in Malaysia. It is not an easy task to acquire them, the country is very strict on sales of chemicals,hence there are not many outlets that sell them because it's a hassle to do so since they must be licensed stockists. Using chemicals is also making a big hole in my pocket, since the imported pesticides and fungicides are very expensive. But for the love of my roses I would to anything to make them bloom beautifully.

I have dedicated a lot of my time to learn about growing roses but experience has taught me that it's often very difficult to find local resources on roses and information on how to grow and care for them locally, that is in Malaysia's wet and humid weather. Although there are thousands of resources about growing roses which have helped me tremendously during my initial years of growing, however these resources come from countries that experience the four seasons and these resources are certainly not viable to be adapted to our local conditions. I am grateful that I was able to get some guidance from two experienced rosarians whom I incessantly

bother day and night. I truly would like to thank them since I am sure that I have burdened them and taken up so much of their time.

In regions that experience temperate climates, rose plants are much easier to care for and they bloom more vigorously, are bigger in size, the colours are more vibrant and the blooms last much longer. I assume that this is partly because, in a temperate climate, roses bloom only once a year, in the summer, and rest during the winter months. This rest period is conducive to the blossoming of big blooms. The climate that I have to endure is constantly hot and humid and rose plants continue to grow and flower without any rest, the whole year round. The plants therefore age quickly and would certainly need replanting. Besides, they will be much weaker and are more prone to insect infestations and diseases. They would also need more constant supply of nutrition.

I am proud to say that I have managed to grow excellent blooms in my humble garden but it's always heart breaking for me to see the roses that are grown in temperate climates. I keep wishing that I can have the size, the colour and the abundant blooms……alas I have to accept the reality …I must stop being like an owl yearning and howling for the moon. Although we are able to grow roses that are blooming beautifully in Malaysia, to have rose plants that are laden with lovely huge blooms is a dream which many of us are still dreaming of, but who knows may be that dream will one day become a reality and I will be the happiest person on earth if I achieve it.

Being an active participator on Face-Book was a blessing in disguise. I became friends with many international growers and the more ardent I am about growing roses I became more and more fascinated in the heritage of roses and committed myself to searching for old roses that were available in Malaysia. With the help of friends I got to know about Kampung Magenta, Pink Damask, Putih Kampung, Yellow Kampung (kampung means village), Sempurna and Rose

Pengantin (Louise Odier) I do not believe in just taking pictures of those roses that have been growing for ages in Malaysia, I wanted to plant them and learn about their habitat and their true origin. After growing Kampung Magenta for just three months I was getting magnificent blooms and I could not resist posting them on Face-Book and the frequent postings rewarded me with solving the mystery of her true identity. I was told that she is actually "Maggie" a village rose that is found in many countries.

In my pursuit of local roses, I also found that the roses that the Malaysians call Rose Pengantin (Bride's Rose) is actually Louise Odier. An interesting discovery was that I found, I have two Louise Odier plants that have similar blooms, however one seems to be a climber while the other is very much like a bush. Sad to say, I am still unable to identify the true identity and origin of a beautiful rose that the locals call Sempurna (Perfect), a rose which is also referred to as 'old rose'. I am patiently growing the rest of the village roses which unlike 'Maggie' are slow to develop but I am sure once they start blooming I will keep on posting on Face-Book and get rosarians all over the world to discuss their true identities and origins.

My interest in planting and learning about the old roses that are grown in Malaysia has also created a new challenge to me. I am getting so obsessed about getting Old Garden Roses, but alas am back to square one. I tried to order the plants from various sources but all I get is a negative reply, "Sorry Mam, we do not ship our roses to your country". Am I sad? Will I give up? No way, I know somehow…. someday my dream of growing old garden roses will materialise.

Lastly, my addiction for growing roses has resulted not only with me having so many plants to take care of, but it has also made me obsessed with taking their pictures. I love clicking the blooms and sharing them on my Face-Book timeline hence, besides buying more and more plants, I keep acquiring better and better cameras too….OMG.

The Beautiful Kampung Magenta.....the village damsel. ..once a forgotten variety but now the craze of many.Crimson and dark pink. Mild to strong fragrance. Medium to large, semi-double to double, cluster-flowered bloom form. Blooms in flushes throughout the season. Her characteristics are similar to those local roses in many countries.

Malaysians call her "SEMPURNA" which means perfect.....yes she is perfect...beautiful dark pink bloom with lovely scent. She is almost thornless and her foliage is dark green and pointed. Recently someone told me her ID could be Mme d. Enfert.....I checked the features, I think it could be correct. This rose also looks very much like Mary Rose…except for the fact Mary blooms in clusters while Sempurna blooms singly

The white kampong rose….it is medium in size and blooms in flushes…Not much is known about her heritage. The bloom is lightly scented. Not many plants found in the country.

Damask rose…very intense perfume…its getting very popular because of its scent. The flower blooms in clusters …rounded buds and dark green foliage. Its features are similar to those of the damask from Thailand

I have tried to ask a few old folks but none was able to tell me anything....may be its because Malaysians were never really interested about growing roses since we are more an orchid country. So no one bothered about the history of roses...I have a suspicion that roses were brought to Malaysia by the wives of British who served in Malaysia and lived in hill stations which have excellent temperatures for growing roses and perhaps some ended up in our villages because in those days local women were employed as house keepers by the British and these women may have brought home some cuttings to plant in their villages.

China Roses - Rosa Chinensis Semperflorens

Extract from Gwen Fagan's 'Roses At The Cape of Good Hope' (reprint 1989) pgs.74 and 76.

On the 10th June 1983 my husband and I landed at Mauritius and, having greeted the taxi-driver who was waiting for us at the airport, we drove off to Grand Baie where we had booked in for a week's visit. Scarcely 10 kilometres from the airport, while driving through an area of many small Creole houses, I thought I saw what looked like a red China rose in one of the little street gardens, and told the driver to stop. On the narrow, traffic-laden road this seemed rather hazardous, but sensing my excitement, the friendly taxi-man pulled off quickly into someone's yard, and I ran back to behold my first *Rosa chinensis semperflorens.*

While my husband took photographs, I made notes and sketches of the plant growing at the entrance steps of a small cottage. The Creoles are a smiling, friendly people, desperately keen to be photographed, so that it was quite a time before we were able to drive off again, but by then I had with me a large bunch of the dainty red flowers, which I had seen illustrated a month before in Jacquin's *Plantarum Shoenbrunnensis* (1798).This painting of Jacquin's had obviously been done from nature, for it very closely resembled the rose which I had just seen and was quite unlike the funny little rose published thirty years previously under the same name in his *Observatorum Botanicum*, which looked more like the specimen collected by Osbeck in China in 1751.[1] {preserved in the Linnaeus Herbarium (T.55)}

After this first encounter with the *Rosa chinensis semperflorens*, I saw it many times again in Mauritius and also,

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a week later, in Reunion where it grows wild in the Plain de Palmiste.

The two-metre high plants have many rather lanky stems with long delicate oval pointed leaves and very dainty semi-double flowers in small clusters at the top of the bush. Sometimes the flowers are single, but more often they have two or three rows of very delicate maroon petals, though occasionally a flower will be pink. They are very much like the 'Old Monthly' in character, but the flowers are in all respects frailer. In fact I know of no other rose as dainty and as airy as this little China rose, and I can well imagine what excitement it must have caused on its introduction in 1792 when Gilbert Slater, who had financial connections with the British East India Company, procured for his Essex garden five plants of the rose which was later to be associated with his name.

'He readily imparted his most valuable acquisitions to those who were most likely to increase them; this plant soon became conspicuous in the collections of the principal nurserymen near town and in the course of a few years will no doubt decorate the window of every amateur', wrote Mr. Wilbur Curtis in the December 1794 issue of his *Botanical Magazine,* when he illustrated and described this rose for the first time as *Rosa semperflorens* or 'Everblooming Rose'.

Because this rose carries in its chromosomes a recessive gene for repetitive flowering, its importance as a 'stud' parent can hardly be overestimated; and so, not only for its own attractions but also for the revolution it caused in the rose-breeding world of the early 1800's, we must pay our respects to this Chinese garden rose.

Incredibly enough it had gone out of cultivation by the end of the 19th century and was thought to be extinct until Richard Thompson discovered it once again in Bermuda in 1953[2] since which time it has been cultivated at Bayfordbury in Britain. However, anyone wishing to see it grown to its full potential should visit Mauritius and Reunion and keep a

sharp lookout in the byways and around the poorer country cottages to catch a glimpse of the small crimson rose' where amateurs still cherish it'

I suspect that *Rosa chinensis semperflorens* has been growing on these two Indian Ocean islands since the middle of the 18th century or perhaps earlier. It was introduced by J. Harrington to the Calcutta Botanic Garden in 1803, and in 1813 Roxburgh recorded it in St. Helena.[3]

There is no clear reference to this rose at the Cape, although 'perpetual' growing in Baron von Ludwig's garden in 1831 is a possibility. I have never seen it growing here myself, but have been told about a small red rose that used to grow at Alphen in Constantia[4] and in the mission town of Wupperthal.

As there is a good chance that some of these roses might have been off-loaded from Dutch or English ships on their way between the West and East, perhaps via St. Helena or the Indian islands, I may still be lucky enough to find a *Rosa chinensis semperflorens* flowering in some remote corner of the Cape.

References:

1. Preserved in the Linnaeus Herbarium (T.55)
2. The Rose Annual, 1960.p.31. Gordon Rowley, *Ancestral China Roses*
3. W.Roxburgh, *Hortus Bengalensis*, 1814. Roxburgh's list of plants growing in St. Helena in 1813 was published by Capt. John Barnes in 1817 after his twelve-year stay on the island. See also S. Pritchard. *List of Plants Growing in St. Helena.* 1836.
4. According to Mrs. J. Rycroft. Dorothea Fairbridge also mentions a small single red rose at Alphen which she calls *Rosa indica* 'the somewhat insignificant parent of the glorious Teas and Hybrid Teas of today'.

Editors Note: Reproduced here with the kind permission of the author, Mrs. Gwen Fagan.

Rose bowl with red and pink *Rosa chinensis semperflorens* in Mauritius

Bunga Mawar Berpagar Duri
(Roses fenced themselves with thorns)
Harum semerbak menusuk hati
(but…. Its fragrance torments every heart)
Jadi igauan sikumbang janti
(hence… the beauty of roses will forever be the
nightmare of the beetles)
Malaysian sayings

Rose Growing in Sri Lanka

Shelomi A. Krishnarajah
and R. G. S. P. Piyasena

Roses are the most popular flowers grown in gardens world wide as well as being ranked first among all cut flowers. In Sri Lanka too rose growing has been a popular hobby in the past. The growing of flowers in Sri Lanka was primarily for worship, beauty and recreational purposes during the reign of ancient Kings as well as the occupation or colonization by the Dutch and British regimes. It was only after the 1950s that the growing of flowers gained commercial value. Growing of flowers and their development has been a major activity of the Botanic Gardens (BG) from their inception. Although the BG were mainly developed for the introduction of plantation crops by the British, flowers and flowering ornamental plants were also brought into the country for cultivation during this period. Many of the flowering ornamentals and roses seen naturally growing today are exotics introduced by the BG many decades ago. However old world roses rarely exist in cultivation today.

Recently however rose growing has become more of a commercial venture and in Sri Lanka roses are grown for cut flower production as well as in gardens for landscape purposes. A collection of garden roses introduced to the country many decades ago are maintained at the Botanic Gardens, Hakgala and most of the garden roses grown in the country originated from this stock which consists of varieties such as Lady Silvia, Crimson Glory and Signora the rather older hybrid tea roses Golden Crown, Mischief and Peace that are rather easy to grow, hybrid tea roses Blue Moon, Crimson Glory and My Choice, aromatic Hybrid Tea roses as well as

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Floribunda roses such as Sea Pearl, Overture, Honeymoon to name a few. Many more are also grown.

Commercial rose growing for cut flower production which is of recent origin commenced during the late 1990's. Long stem Hybrid Tea roses (70-90 cm stems), medium stemmed floribunda (50-70 cm stems), short stemmed roses (30 -50 cm stems), spray roses and miniature roses are most popular categories for commercial cut flower production in the country. Red roses are the most popular especially for special occasions and weddings closely followed by whites. Internationally popular varieties such as Red Berlin, Grand Gala; White Success and Avalanche etc. are cultivated for cut flower production.

While 3-4 large scale growers produce roses for export as well as for domestic consumption, nearly 20-25 medium and small scale growers produce flowers purely for local consumption. A larger segment of 100- 150 growers produce rose plants for sale as potted plants or budded plants for local sales.

Many stately homes, hotels, banks and office complexes in the Nuwara Eliya and Badulla districts of Sri Lanka adorn their gardens with a variety of colourful roses. Thus garden roses for landscaping are also very much in demand.

Climatic Conditions:

Commercial rose growing is preferably done in temperate regions or under subtropical climatic conditions. Roses grow well at altitudes between 1800-3000m above sea level. Ideal temperature for rose production is between15-24^{0}C. Thus optimum growing conditions are found in the up country areas such as the Nuwara Eliya and Badulla districts of Sri Lanka. They may be grown under full sun light with relative humidity levels maintained at 65-75% around plants.

Plant growth and flowering is affected when available light is less than 12 hrs per day and cloudy conditions prevail

for long periods. When temperature levels drop below 15^0C bud initiation is reduced.

Growing Media and Planting System

Roses are grown under poly tunnels with controlled environmental conditions, on raised beds for continued harvest of quality flowers for commercial purposes. However garden roses are grown on outdoor beds and generally flowering is seen throughout the year except during the monsoon seasonal rains.

Growing media with soil and organic manure or artificial substrate such as coir dust may be used for rose cultivation. Top soil, loam soil, leaf mould, cow dung, sand, wood, ash, oasis, pumice and coir dust are some of the materials used as growing media for the cultivation of roses. Growing media should preferably have a pH of 5.5. Different combinations of substrate are used in the cultivation of roses as mentioned below.

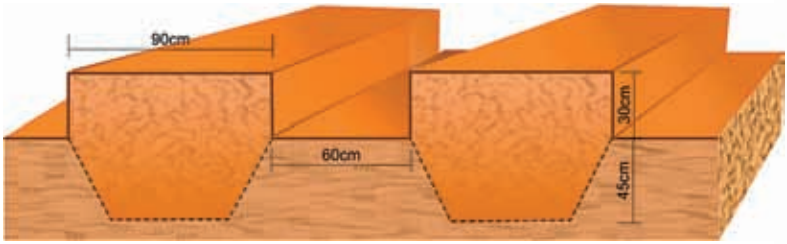
Eg:Loam soil: leaf mould: cow dung: coarse sand: wood ash- 6:2:3:2:1

Top soil: leaf mould: cow dung: coarse sand-2:2:1:1

Coir dust only (fertigation is recommended when growing on coir dust)

Commercial cultivation of cut roses is commonly practiced on raised beds with a mixture of top soil, cattle manure and river sand at a ratio of 5:4:2 or coir dust only. Beds should be preferably 30 cm in height, with a depth of 45 cm below ground level making total depth of beds 75 cm, width preferably 90 cm as shown in diagram. A space of 60 cm may be kept between beds. Length of beds may be decided according to availability of land, plants are spaced 40-50 cm apart with 17cm between rows leading to 6-7 plants per sq. m.

The spacing between plants and rows may be changed as follows for harvest of larger flowers and longer stem lengths: 30x45, 45x45, 45x60 & 60x60



Roses generally require 3-9 months to flowering from the time of planting in beds. Generally, healthy, disease free plants with at least 2 pairs of leaves and 2-3 months after grafting are used for initiation of cultivations.

Bending and other cultural practices

In certain instances flower buds may develop 4 weeks after planting, in such cases buds need to be removed to promote vegetative growth and produce a sturdy bush. Leaves below the buds are not removed at this instance and only the bud is removed. If axilliary shoots have initiated below the flower beds they also should be removed. Care should also be taken to not allow shoots of the root stock to develop and grow. Flowers are initially harvested leaving 5 leaf pairs from the base of the plant and subsequently leaving 2 leaf pairs from the base of the shoot. This leads to proper management of the bush height as well as optimal flower stalk length.

Bending is practiced on blind shoots or shoots that do not flower. These shoots are bent in such as way that they are not separated from the mother plant. Bending is usually done at a point above 3 leaf pairs from the base of the plant. Bending leads to the formation of sturdy new shoots that produce quality flowers.

Weeding and loosening of the soil/growing medium should be done once in 2 weeks for cut flower as well as garden roses.

Irrigation

Routine irrigation is required daily when plants are grown under poly tunnels. Clean sediment free water should be used. Chlorinated water or hard water is not recommended.Watering frequencies may be reduced during the rainy season and completely stopped for our door grown roses.

Propagation

Roses are propagated through grafting /budding. Rooted cuttings of naturally available wild roses are used as the root stock while the scion is taken from improved hybrids/ varieties. Generally the inverted 'T' bud method is used for grafting for both garden and cut flower roses in Sri Lanka.

Garden Roses

Climbing and Rambling Roses

Plant heritage and the national plant collections

Mercy Morris

Conserving cultivated plants is a tricky business; balancing the cultural imperative to preserve human history and achievement and the global need to conserve biodiversity with scarcity of resources at a human and financial level.

History

Plant Heritage, formerly National Council for the Conservation of Plants and Gardens, has been working to conserve the cultivated plants of UK and Ireland since its inception in 1978. Born out of an era in which financial and political pressures meant that plants were disappearing from commerce at an alarming rate, Plant Heritage has a wide mandate:

- Conserving cultivated plant diversity
- Understanding and documenting cultivated plant diversity and using it sustainably
- Educating and disseminating information about cultivated plants and their conservation
- To communicate, network and cooperate with other organisations to facilitate our priorities

National Collections

The primary vehicle for achieving these aims is the National Plant Collections. From recruiting the first collections in 1981 there are now 624, ranging from *Abelia* to *Zingiber*: 61 in Scotland, 521 in England, 32 in Wales, 4 in Northern Ireland and 5 in the Republic of Ireland. Of these 624 Collections: 214 are held by private individuals, 133 by commercial

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organisations (mainly nurseries), and 277 by institutions (botanic gardens, National Trust, Royal Horticultural Society).

In terms of types of plants, 97 are species collections (plants of direct or indirect wild origin); 157 are cultivar collections, and 370 are mixed. They range from trees to alpines, covering vegetables, fruit, tropical and indoor plants, cacti, carnivorous and ferns.

Why conserve garden plants?

Why do cultivated plants need conserving, surely our gardens are full of them? Our garden plants are inextricably bound up with our cultural and social history; the plants collected by plant hunters, or bred by amateur enthusiasts are as important to our history as our stately homes and art. Like grand houses and old masters they are vulnerable to all kinds of threat, and need constant work to conserve.

Many types of plants are a representation of our horticultural heritage. For example the cottage garden, the allotment, the clipped formality of the stately home have been founded on 'old-fashioned' varieties such as old pinks, florists' violas, tulips, the roses beloved of writers and growers alike. These plants and their cultivation are often very specialist and tied in with the places in which they used to be grown.

There will always be a need for living plant reference libraries where all the plants in a particular genus or group can be seen together, compared and researched. As funding for botanic gardens and parks comes under increasing threat, the need to conserve these reservoirs of genetic material becomes more urgent.

What are the threats?

What are the threats to cultivated plants?Climate change and severe weather are becoming more prominent among causes of plant loss in the UK. Recent examples of this are flooding, unusually cold winters, droughts, strong winds. Gardeners relish growing plants at the edge of their natural

tolerance, and this can mean the loss of many plants during extremes of weather.Some plants are intrinsically difficult to propagate or grow; some are difficult because they require skills that are now scarce in the UK. The decline in importance of botanical and horticultural knowledge has led to a scarcity of educational opportunities; and once-common skills of grafting, pruning and propagating are becoming rare.

Over many years, large gardens, parks and allotments have been used to build housing and offices, or for roads or sporting facilities. Changing fashions in gardening mean that features that used to be common in large gardens are rarely seen. Currently fashionable uses (vegetable growing, bee-keeping, outdoor eating) tend to replace large rose gardens and bedding displays.

Vandalism is responsible for many plant losses in parks and allotments, and has in the past resulted in the withdrawal of whole National Collections. A reduction in staff or change of use of a public area can very quickly render it unsuitable for growing plants safely.Invasive plant species are vigorous competitors and achieve dominance at the cost of the plants around them. However many plants that are regularly grown in gardens and parks run the risk of being labelled invasive if the relevant legislation is inappropriate in terms of risk or species listed.

Due to the global nature of the plant trade, there are an ever-increasing number of pests and pathogens that are appearing in countries where they had not previously been known. This means that often plants have no natural defences against them, and the pests have no natural predators; leading to a situation where they can rapidly reproduce beyond the possibility of control.

Financial instability at global, national or local level tends to hit small, specialist nurseries. By their very nature these nurseries are not financially robust and are vulnerable in times of poor economic outlook. It also leads to a reduction in the

resources available at government level to fund gardens, parks and gene banks.

Plants are very affected by fashion; during the periods when they are out of fashion, there is no financial return in maintaining a large range of these plants and many cultivars die out. One day *Heuchera*, *Hemerocallis* and *Hosta* will become unfashionable, and the huge number of cultivars now grown will shrink as plants become extinct.

Rose collections

There are some groups of collections which are immensely significant from a cultural and historical perspective in the UK. One of those is roses. Over the last 30+ years, Plant Heritage has had 18 *Rosa* collections and of those 11 are still in existence.

- *Rosa* (19th century shrubs), National Trust for Scotland Malleny Garden
- *Rosa* (pre 1900 shrub roses) National TrustMottisfont Abbey
- *Rosa* (English roses bred by David Austin) David Austin Roses Ltd.
- *Rosa* (Peter Beales old rose collection) Peter Beales Roses Ltd.
- *Rosa* spp & cvs., Royal National Rose Society, St Albans.
- *Rosa* introduced by Pemberton & Bentall 1912-1939 St Francis Hospice, Essex
- *Rosa spinossissima* (*R. pimpinellifolia*) Scots roses & hybrids, Mr P Boyd, Shropshire
- *Rosa spinossissima* (*R. pimpinellifolia*) Scots roses & hybrids, Mrs Jane Hepburn, Ayrshire
- *Rosa rugosa*, Mrs Jane Hepburn, Ayrshire
- *Rosa* (rambling roses), Henry Robinson, Cirencester
- *Rosa* (pre 1900 Gallica cvs.) Mrs R Foyle, Scottish Borders

Collections globally

The conservation of cultivated plants within collections is not limited to the UK. There are other similar organisations

across the world, and we hope more being fostered at the moment. The requirements are a pool of horticultural and botanical experts to assess and monitor standards; a solid system of administration and data collation, and the ability to evolve as the political and horticultural environment changes, both nationally and internationally. And of course – lots of plants!

Plant Heritage (UK & Ireland): www.plantheritage.com

Conservatoire des Collections VégétalesSpecialisées (France)http://www.ccvs-france.org/

North American Plant Collections Consortium: http://www.publicgardens.org/napcc

NetzwerkPflanzensammlungen (Germany)http://www.netzwerkpflanzensammlungen.de/

Garden Plant Conservation Association of Australia http://gpcaa.typepad.com/

NederlandsePlantenCollecties(Netherlands)http://plantencollecties.nl/Home/999

StichtingNationalePlantencollectie (Netherlands)

Plant Heritage, 12 Home Farm, Loseley Park, Guildford, Surrey, UK. GU3 1HS 01483 447540

***Editors Note*:** Similar National Collections of roses in countries of our region would be welcome and help to preserve and document heritage roses which have been grown for generations, and which are likely to disappear unless conserved.

The Complete Gardener - Mr. K.S. Gopalaswamienger: A Horticultural Legend

G. Kasturirangan

I consider my father K.S.Gopalaswamiengar a great amateur gardener, who grew into a famous horticulturist and the author of 'Complete Gardening in India', (first published in 1935) considered by many as the bible of horticulture in India.

Born on September 19th, 1895, he had a passion for plants, and when in 1913, his father Rajasabhabhushana Dewan Bahadur K R Srinivasa Iyengar, First Member of Council under Sri Krishna Raja Wodeyar, Maharaja of Mysore, moved to a sprawling house with a two acre garden, in Bangalore, this passion was given full rein- growing, studying, researching a wide range of plants. The property, 177, 5th Main Road Chamrajpet is still with us. Though his college degrees were in chemistry and law, he was self taught in horticulture. He joined many horticultural societies and became the Honorary Treasurer of the Mysore Horticultural Society for 16 years (1930 to 1946).

The huge garden provided him ample space to collect varieties of crotons, bougainvilleas, ferns, bulbous plants, roses, cannas, foliage plants, etc. He also had at his disposal another four acres of land adjoining this property to experiment with vegetables and fruit trees.

He made full use of the proximity of the well known Lal Bagh Gardens, and especially of its well stocked Library. He

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tasted his first success as an amateur exhibitor at the Lalbagh Horticultural Show in February 1918, winning three prizes following it up with six in the August Show and from then on it was a matter of routine for him to walk away with many prizes in the various plant sections in every show.

In 1913 his marriage into the prestigious 'The Hindu' newspaper family helped him in innumerable ways.

When his own garden won a 'Residential Garden' prize it brought Mr. Krumbiegal, the Director of Horticulture, to his house, and over the years the friendship grew and bonded into a great mutual admiration and respect for each other. In later years Mr. Krumbiegal encouraged him to write a basic gardening book for amateurs.

In 1922, after growing various kinds of plants for over a decade, and all the while recording his keen observations in meticulous notes, he began creating new and improved hybrids of many plants like crotons, hibiscus, cannas, etc. It was also in this year that he introduced the giant cockscomb (*Celosia cristata*) which won him a very special prize and which has become a Bangalore speciality.He would not hesitate to learn from ordinary gardeners (malis) or other staff of the Horticultural Department at Lalbagh, and elsewhere, like Mr.Thomas Royer, an outstanding horticulturist.

By 1926, he had begun writing a weekly column 'Gardening Notes' for "The Hindu" newspaper which was to become the foundation of his comprehensive book on gardening, 'Complete Gardening in India' published in 1935 with a foreword by G.H.Krumbiegal. The book was very well received in the gardening world, being acclaimed as a complete treatise on the theory and practice of home gardening , in all aspects, an undisputed botanical classic and reference work. He revised and enlarged the second edition of the book, which came out in the year 1953 just prior to his untimely death in 1955. Mr. Krumbiegal in his Foreword writes: *"Mr. Gopalswamiengar, by taking full advantage of facilities*

for study and practical demonstration afforded by various sections of Lalbagh has become a successful raiser and grower of plants and has enlarged his active connection with the work of the Mysore Horticultural Society. This book written by an amateur for amateurs, should help clear most of their practical difficulties'.

He was very fond of bulbous plants and his first book in fact was 'Bulbous Plants of India' published by the Mysore Horticultural Society in 1933 and very well received by the plant aficionados.

I brought out a third edition of 'Complete Gardening in India' with a foreword by Dr. B. P. Pal (Director, I.C.A.R.) in 1972.

The fourth edition was printed in 1991 by my brother G. Parthasarathy and his son. P. Mukundan, with my two other brothers and myself being editorial board members and with a Foreword by Dr. G.S. Randhawa.

All the while he pursued his legal profession, but it was, at best, only a bread and butter career. Gaining the agency for 'The Hindu' newspaper for all of Bangalore, in 1929, greatly helped financially, enabling him to buy a 19 acre plot of land on the outskirts of Bangalore (what is now Banashankari) – and he set about planting it with his innumerable collection of plants, all the fruit trees that could be grown in Bangalore conditions and a mango varietal collection of over 50 varieties.

Between 1920 and 1940, crotons were his specialty. By growing thousands of seedlings, diligent screening and evaluation, over 600 hybrids had been created, named and popularized. These hybrids won many prizes, medals and cups in shows all over India, bringing them a distinct identity called 'KSG'S BANGALORE CROTONS'.

They were named for dignitaries like 'Sri Krishnaraja Wodeyar', Sri Narasimharaja Wodeyar', 'Sri Jayachamaraja Wodeyar' ,'Smt Gayathri Devi' (of Mysore), 'Pandit Nehru',

'Annie Besant', 'Sir Mirza Ismail', G.H.Krumbiegal', 'M.H.Mari Gowda' and 'Nawab Shah Alam Khan' as also relatives and friends, stars and rivers . These crotons have to be seen to be believed.

He had so many lovely plants, which were in excess of his needs, so he started a nursery "K S GOPALSWAMIENGAR" which went on to supply genuine, properly labeled plants of all varieties, to amateur growers as well as professionals, academicians, science and research institutions. He would label each plant himself.

The lovely salubrious Bangalore climate in the unpolluted 1920s and 30s made it easy for rose culture. Bangalore and roses were synonymous. While crotons were my father's first passion, roses by their universal appeal as well as their religious and spiritual significance were his next favorite.

Like any other plant group that he grew and cherished, and excelled in their cultivation, he meticulously went about collecting various cultivars of roses from the 1920's. By the 1940s, his rose collection was a staggering 150+ varieties, which grew by the 1950's to nearly 350 cultivars, in all categories -Hybrid Teas, Floribundas, Miniatures, Polyanthas, Climbers and a few novelties.

Most of the roses were collected from Sundar Nursery in New Delhi, Glory Garden in Mihijam, W.Bengal, Imperial Nursery in Calcutta and from a nursery in Meerut. They were grafted plants and a few budded plants. I list some of the popular varieties from his vast collection:

Hybrid Teas: Admiration, Captain Christy Daily Mail Scented, Dame Edith Helen, Edward VII, E.G.Hill, Etoile de France, Etoile de Holland, General MacArthur, Golden Dawn, Gruss an Teplitz, His Majesty, J.B.Clarke, Lady Margaret Stewart, Kaiserin August Viktoria, La France, McGredy's Scarlet, Margaret McGredy, McGredy's Triumph, Mrs Sam McGredy, President Macia, President Herbert Hoover, Shot Silk, Talisman.

Chinas: Archduke Charles

Hybrid Perpetuals: Black Prince, Duke of Wellington, Frau Karl Druschki, Paul Neyron

Teas: Bride, Devoniensis, Climbing Lady Hillingdon, Madame Falcot, Maman Cochet (white, and pink), Molly Sharman Crawford, Mrs. B.R.Cant, Mrs Herbert Stevens, W.R.Smith, Souvenir de la Malmaison.

Moss: Crimson Globe

Pernets: Independence Day, Souvenir de George Pernet, Condesa de Sastago – (now all are classified as H.T.s)

Noisette: Lamarque, Cloth of Gold, Marchal Niel

He got many Hybrid Teas from McGredy's, (Ireland), and Wheatcrofts (UK). These were imported after 1951. They reached after 17 days, by Foreign Post Parcel, after having a torrid time with the Customs and Phyto-sanitary officials. One set of plants were grown in pots and the other set in the ground as mother stock. I not only enjoyed these roses which were slowly becoming my favourites, but learned practical rose culture from him from the grassroots.

The art and science of rose growing from the basics of potting the plants, soil mixture, pruning, shaping , thinning the branches, controlling the growth by effective moisture control and watering , time and quantity of application of oil cake solutions, fertilizers, were all firsthand training from him. All these cultural practices were done throughout the year to keep roses in constant bloom and also to bring them to precise blooming during the judging day of the two Lalbagh shows.

To sum it up, I learnt all about rose culture that no university degree could teach by just being with him, taking his instructions, carrying them out, just like all the other malis that he trained.

Earlier, roses were propagated by cutting, layering and grafting. He taught us to propagate roses by budding, first

by using plantain fibre, then by raffia fibre and finally with Polythene for tying the bud-eyes.

Being with him and growing these roses to perfection, be it for the house or for the show, the legacy of 300 and odd varieties that he left behind was most inspirational and a guiding factor for me to take up rose cultivation as a Specialty. He inspired in me and inculcated an insatiable urge to grow roses to perfection , and kindled a craving to acquire as many and new varieties as possible. .

It was also in the 1960s that my friendship with the great rosarian B.P. Pal ,M.S. Viraraghavan Nawab Shah Alam Khan and other rose growers all over India developed, and motivated not only the collecting of roses from all over the world but also to start breeding which I do to this day. I dedicate all our new hybrids to his memory, since I started breeding with his legacy of roses.

Bougainvilleas were another favourite. There were hardly a dozen bougainvillea varieties in the mid-1930's. He set about collecting seeds from these plants and growing seedlings to select superior forms. His first hybrid was compact growing and he named it 'Gopal' on the insistence of his friend Thomas Royer and others. He brought about a change in the way bougainvilleas were grown. Mostly Bougainvilleas were grown as fencing plants, hedges, and stand alone specimens on lawns. He created a new dimension by growing them in large cement tubs. This made the plant bloom more often and thereby increased its popularity among plant lovers and this tub culture was enhanced by the arrival of the variety called 'Mrs. Butt'. He named another beautiful hybrid after Mr. Krumbiegal who had retired as Director of Horticulture by then. He named another very good hybrid after his second daughter 'Jayalakshmi' and, a few years later, another called 'Partha'. By the late '40s he had many outstanding hybrids like 'Scarlet Glory' and 'Srinivasa' (named for his father)

Due to space constraints, he planted on the fencing of his farms and as they flowered, he assessed their qualities and selected the best for release as named hybrids.

In 1948 when Mahatma Gandhi was assassinated, he named an outstanding large, bracted, glowing pink flowered variety in his honour, and subsequently before his own death, a variety called 'Happiness'. When he released this hybrid, he did not realize that he had created a new group under the Bougainvillea genus, which later, in mid 1950s, were classified as 'Bougainvillea buttiana' group by Dr. Holtumn of Singapore.

He had a passion for annuals, perennials, shrubs and ornamental foliage. All of these were grown in pots to perfection and exhibited at the Lalbagh shows. He imported many annual and perennial seeds from abroad, especially from RHS, England, of which he was a member.

He specialized in a variety of fruit trees, but particularly mangos. He supplied only genuine, true to name labeled plants or seedlings. One such mango variety, 'Himam Pasand' was popularized and planted on a large scale.

Though he suffered Hemophilic and Rheumatic Arthritic problems from an early age and diabetes in the later years, he was very active till the end, due to his love for plants. His gardening hobby carried him through all difficulties.

Preparation of this article was possible by his own diary notes maintained by my nephew P Mukundan.

The legacy of K S Gopalswamiengar. a versatile self made horticulturist is continued by G Kasturirangan (myself), my son K Sriram, my grandson Sarvesh Sriram and my nephew P Mukundan and his son Shashank.

Who has not heard of the Vale of Cashmere,
With its Roses, the brightest, that earth ever gave?

Knowing Roses: Old Garden Roses

Dr. Kalyan Chakrabarti

All the garden roses are hybrids, involving only few species roses (eight to twelve). Species roses are also called wild roses. They are found to grow in nature in different parts of the world. Curiously, they are found only in the northern hemisphere; not a single species grows in the southern hemisphere.

The year 1867 is significant in the history of garden roses. The first Hybrid Tea (H.T.) rose, 'La France', was introduced in this year by the French rose breeder Guillot from a cross of a Hybrid Perpetual (H.P.) 'Madame Victor Verdier' with a Tea rose 'Madame Bravy'. The group of roses introduced and grown in the garden, before 1867, is called old garden roses (OGR'S), alternative as heritage and historic roses. The roses developed after 'La France' are designated as modern roses like H.T., Floribunda etc.

The characteristics of modern roses starting from 'La France' include: repeat flowering (remontancy), wonderful bud and flower forms (like high centered, long point), wide range of petal color and stability in sun (suntan) etc. All those properties of the newly developed modern roses tempted the rose lovers more towards them. Interest in the OGR'S declined. However, within recent years there has been a revival of interest in OGR'S. Based on their performance in different climates, they could be divided as Western Roses and Eastern Roses.

Western Roses: Albas, Gallicas, Portlands, Damasks, Moss, Centifolias or Provence Roses and Hybrid Perpetuals.

These roses remain happy in the cold climates of the western world. They blossom but only once in the season and are deciduous. They throw up rooted suckers, may be

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propagated by layers and not by cuttings. The blooms are usually fragrant, double and in shades of white, pink and crimson-red. The introduction of China and Tea roses from East Asia around 1800 led to new classes of OGR'S which bloom on new growth, often repeatedly from spring to fall. Possibly, this group of western roses has never been introduced in the gardens of India, the only exception is the Damask rose which is locally known as 'Bussorah'. It thrives in tropical India and 'Bussorah' blossoms best in the winter. The blooms are pink and highly fragrant. Personal enquiry revealed that this rose is in high demand in Assam for the preparation of rose water. Hence, the nursery men in the district of Midnapore, West Bengal propagate a large number of this rose.

The H.P. roses, the product of the cross of a western rose (say a Gallica) and an eastern rose (say a China), were first introduced in 1838. Group of old roses like Bourbon, Chinas, Teas, Damasks, Gallicas and the Noisettes were in the back ground of the H.P. roses. They were popular during Victorian times because of their large flowers on long stems. An experienced rosarian in West Bengal told me that these roses were in demand for exhibition and cut flower trade. At one point of time, an endless number of H. P. roses were in existence. At present, few varieties are available in W. Bengal: 'Paul Neyron', 'Frau Karl Druchski' etc. Lanky growth and unmanageable canes of the H.P. roses in comparison to the bushy and balanced growth and more free flowering nature of the H.T. roses caused their gradual retreat.

Eastern Roses: China, Bourbon, Noisette and Tea roses.

Roses of these groups resent cold climates, but they are at home in our tropical climate, blooming more or less throughout year, and remain green. They throw no suckers, can be easily propagated by cutting, layering and budding.

China or Hybrid China roses: During 18th Century development in rose culture was perceptibly slow as roses were then once flowering only. Towards the close of the 18th

century and the beginning of the 19th century, the introduction of repeat flowering China roses, fragrant roses with the smell of fresh tea and the fashion initiated by Empress Josephine at Malmaison, France, led to their development. According to the notable English botanist Dr. C. C. Hurst, four Hybrid China roses introduced in 1792, 1793, 1810 and 1824, were instrumental in the development of modern roses. The four Hybrid China roses are: 'Slater's Crimson China' (1792), 'Parson's Pink China' (1792), 'Hume's Blush Tea Scented China' (1819) and 'Park's Yellow Tea Scented China' (1824). All these four Hybrid China roses are well known as Hurst's Stud Chinas. The imported China roses were impatient of cold climates of the west, thus they were crossed with cold tolerant western roses like Gallicas, Centifolias, Damasks and the Albas. The idea was to create cold tolerant perpetual blooming roses. Effort in this respect was made mainly by the French rose breeders. According to late B.S.Bhatcharji, an eminent rose breeder from India, there was two groups of Hybrid Chinas, those directly imported from China and those from Europe. Varieties like 'Perle d'Or', 'Cecile Brunner', 'Cramoisie Superior' are progenies of original China roses; others like 'Archiduc Charles', 'Gruss an Teplitz' etc, are hybrids of China roses crossed with European roses.

At one point of time, China roses were very popular in Bengal as evident from works of Rev. Firminger. According to him, these roses were more dwarf and compact in their growth than those of most other groups. They thrived vigorously, bloomed throughout the year and could be easily propagated by cuttings. Unfortunately, they are almost extinct, like other OGR'S.

To my surprise, recently I discovered that about 100 or more red China varieties are growing in the garden situated within the boundary of the Jagannath temple, Orissa. The garden is very near the western gate of the temple. The flowers are regularly used for the worship in the temple. I also observed that China roses were growing on the lawn of the

OTDC tourist lodge at Rambha along Chilka Lake. China roses were also found growing in the islands of the Andamans too.

A personal survey revealed that five to seven Hybrid China roses are still available in W. Bengal. One of them seems to be the 'Archiduc Charles' and the other one is the green rose Viridiflora.

Bourbon rose (R. x borboniana): This rose seems to be directly imported to India from Isle **of** Bourbon or perhaps from Mauritius. 1n 1817, it was first noticed in the former island. Hence, the name Bourbon rose. Around 1822, it was well distributed. It did not take long to reach Calcutta. Rev. Firminger reported that it was very common as early as 1832. The entire novelty, its large double flower, its property of blooming more or less throughout the whole year and easy propagation made these roses very popular in most gardens.

It was speculated that its parentage is the 'Autumn Damask' crossed with 'Old Blush China'. Some of the notable varieties of this type of this rose of that time include; 'Pheolina', 'Hermosa', 'Souvenir de la Malmaison' etc. The later one is still available in W. Bengal.

Noisette rose (R. Noisettiana): The original rose of this group is stated to have been a cross between 'Parson's Pink China' ('Old Blush') with *Rosa moschata*. This resulted in 'Chapney's Pink Cluster', the seedling of which produced the first member of this group 'Blush Noisette'. 'Chapney's Pink Cluster' was raised in U.S.A by John Chapney. 'Blush Noisette' and the subsequent Noisette roses were raised in France. The name Noisette of this group was given in honour of Philippe Noisette for his initiation in this work. The Noisettes on further cross with the Tea roses produced Tea-Noisettes. These Tea-Noisette roses were very popular among the rose growers and the lovers for their sweet smell and their growth.

Rev. Firminger observed that this group of roses thrived well in India. They bloomed all through the year. The number

Aussie Sixer, a new Tea rose

of varieties was, however, small. 'Marechal Niel' the most magnificent yellow rose known is a Tea-Noisette. It is still found in and around Calcutta.

Tea roses or Tea scented roses: Tea roses were highly valued in their prime time, which is evident from the following comments:

'If the Rose be the queen of flowers, the Tea scented Rose may be regarded the queen of queens'

'The true aristocracy of the rose world'

The origin of the Teas is speculated to be a mixture of *R. chinesis* and *R.gigantea* resulting in the hybrid species R. x odorata which is otherwise 'Hume's Blush Tea- scented China'; and its variety R. x *odorata ochroleuca*, which is 'Park's Yellow Tea-scented China.'

This group of roses was highly praised for their sweet scent, nice bushy growth with attractive foliage. Some people considered the smell of the Tea-rose flowers akin to fresh tea leaves. Tea roses are one of the sources of modern roses.

Unlike most plants introduced from China, Tea roses thrived and blossomed to perfection in India. In European cold climate, they were not happy. Thus, European rose growers desired cold tolerant roses with good qualities of the China roses. Continuous research in this respect led to the development of H.T. and Floribunda roses. Some attractive varieties of Tea roses included 'Mme Bravy', 'Moiret', 'Devoniensis', 'Sombrieul' etc. The last two varieties are still available in W. Bengal.

New Light on An Old Foe

Dr. N. V. Shastri

Garden roses are perpetually affected by a multitude of insects, pests and diseases. Whatever might be the claims made to the contrary, it is undeniable that as of today, regular spraying of insecticides and fungicides is absolutely essential if you wish to keep your rose plants healthy and productive for extended periods. Insects and pests are not the subject of this article but diseases are. There are many diseases from which roses can suffer. This paper deals with one such disease, the troublesome Powdery Mildew.

Diseases from which roses might suffer include those caused by viruses, bacteria and fungi. Among these, fungal diseases are more common and cause more headache to a rose grower. Two fungal diseases are the most prominent. One is black spot caused by *Diplocarpon rosae* and the other is powdery mildew caused by *Spodosphaera pannosa.*

Apart from roses, several other plant species such as wheat, soy bean, grapes, strawberries, tomato, *Arabidopsis thaliana* (a sort of guinea pig of plant research) etc. suffer from powdery mildew. Different species of fungi are the causative agents in different plants. In roses, *Podosphaera pannosa* is the fungal species involved. (in grapes it is *Erysiphe eneactor*). In turn, a given fungal species can exist in the form of different strains, distributed in different geographical regions. Thus, different variants/strains of *P. pannosa* are found in different places. These strains, though very similar, may differ in virulence properties. This may be due to small differences in their genetic make up. Some cause a more serious threat than others

As mentioned above, regular spraying of fungicides is required if you want to keep your roses free of mildew.

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A host of substances and proprietary fungicides have been described and a seasoned rose grower is acquainted with most of them. They range from simple things like baking soda, magnesium sulphate, water-vinegar or insecticidal soaps to the complex organic molecules created by chemists in research laboratories of universities or chemical industrial establishments. Two " sprays ", perhaps not very well known in India, may be mentioned in passing. One is silicon or silicate solution and the other is cow's milk (diluted 1:10). Silicon protects the plant cells by degrading fungal haustoria (an appendage to parasitic fungal cell) and by producing callose (a polysaccharide) and papilla (a raised thickening in plant cuticle) as a shield. As far as the milk spray is concerned, a protein called ferroglobulin present in whey is supposed to be the active principle (apparently acting via the production of reactive oxygen species that are harmful to the fungal cells). It would be interesting to see the efficacy of these treatments, particularly milk in our conditions. Epidermal cells have been reported to become less susceptible to mildew by milk spray in wheat.

Although he (it could very well be 'she' although I have used 'he' throughout this article) can not avoid using them in practice, every rose grower wishes to minimize the use of toxic chemicals. This can be possible to some extent if efforts are made in the first place to decrease the disease load by adopting some healthy gardening practices. You have to ensure that there is sufficient sun light (avoid shady sites), and good air circulation (keeping sufficient distance between plants and keeping the inner area of the bush open by periodic thinning).

All rose experts tell you that for a healthy rose garden you should. in the first place seek to plant disease resistant varieties. The trouble is, the number of such cultivars available among modern roses is very limited. To be sure, all living organisms including plants in the course of their evolution, have acquired a set of protective mechanisms called innate immunity. By virtue of these, the organism (e.g. a plant)

recognizes a pathogen and attempts to kill and eliminate it. It is now recognised that several kinds of interactions between the host and the pathogen take place during infection. We are still far from getting a clear picture.

One such mechanism is to respond to infection by producing substances (phytoalexins) that help to contain the infection in the early stage. But when these innate mechanisms prove insufficient, the infection spreads and the disease occurs. However, as a part of the evolutionary process, due to the survival pressure, some species have additionally managed to acquire specific resistance capacity against certain pathogens. In the context of powdery mildew in plants, these are the mildew resistant varieties (mostly species roses). Coming back to powdery mildew in roses, one and perhaps the best answer to this problem would be to create roses that are inherently mildew resistant and that is what the breeders have been all along trying to do. An obvious approach to achieve this is to use mildew resistant varieties in your breeding program so that the new roses inherit their resistance trait. Many species roses and some old garden roses are known to be mildew resistant. They include: *Rosa roxburghii, R. sterilis, R. kweichonensis, R. laevigata, R. lucidissima*. Interestingly, an association between mildew resistance in roses and thick and shiny young leaves or rugose (wrinkled) young leaves with prominent veins has been reported..

Since the trait of mildew resistance in plants studied so far appears to be a stable trait, it is most likely to be genetic in nature. Since many economically important plant species, including roses, are susceptible to powdery mildew, a new field of research on the genetic basis of mildew resistance has emerged and now is an active field of plant biochemistry and molecular biology. It is expected that these studies would be able to suggest novel ways to obtain mildew resistant plants. Such research on roses is a comparatively recent phenomenon. The first thing scientists started doing was to look for putative "mildew resistance gene ".

Research on the genetic basis of powdery mildew resistance is being carried out in several plant species including soy bean, *Arabidopsis,* many others and of course, roses. The relevant gene and its location on the host DNA in some of them has been found. It is called "mildew resistance locus o" (*mlo*). In a given plant species there are several *mlo* loci (gene families) distributed on different chromosomes. Now, a given gene locus contains a piece of DNA that codes for a particular protein. This biologically functional protein (MLO) is the ultimate product of that gene. This protein was thought to be some how involved in making the plant resistant to mildew.

In reality it turned out to be a bit of a paradox. The functionally active MLO protein in reality makes the plant susceptible to mildew! *(mlo* is actually the mildew susceptibility gene !!).Although the mechanism of MLO action is at present not fully understood, it appears that it acts as a portal for the entry of the fungus in to the plant cell. This protein is present in cell membrane in plants. It is a trans-membrane protein which means that it transverses the width of the membrane connecting the inside and outside of the cell. What this implies is that if a plant species has a normal functional MLO, the fungus would be able to enter the cell and infect it but if the MLO is abnormal or dysfunctional, the entry of the fungus into the plant cells would be blocked and the plant would be mildew resistant ! Now this can happen only if the gene (*mlo)* coding for it is either defective or lacking (either as a result of spontaneous or planned mutation). In agreement to the above premise, all mildew resistant plant species (including roses) so far investigated have been found to possess mutant *mlo (s)* so that the corresponding MLO (s) produced by them is (are) dysfunctional. In fact, observations that mildew resistant species differed from the susceptible species at certain genetic loci actually led to the discovery of *mlo*.

Biological systems are complicated and. *not* unexpectedly, it turned out that the role of MLO proteins is not confined to powdery mildew. For example, MLO proteins have also been shown to be involved in several other functions including pollen development and root development. Further, MLOs coded by different *mlo* loci appear to differ in their functionality. Many laboratories are now engaged in trying to solve the issues involved. The idea is: more fully you understand the processes involved, better placed you would be to confront the problem of your interest — in our case, mildew resistant roses.

The question that may now come to the mind of an average rose lover is : how can this research be translated in the actual creation of mildew resistant roses ? The road map is fairly obvious : try to create a mutation in a selected rose variety by which the *mlo* becomes dysfunctional or lacking and use this mutant in your breeding program. It is probably still a long way to go but there is reason to believe that in near future the new biology would enable us to create appropriate *mlo* mutants at will.

In conclusion, it should be remembered that how a particular rose variety reacts to mildew infection is decided by both the constellation of resistant genes inherited by it and also the fungal patho-type. It has been suggested that breeders would do well to take into account such interactions. The ideal strategy would be to create roses that have inherited as many different resistance genes as possible and also different defence mechanisms.

A rose does not preach – it simply spreads its fragrance

Mahatma Gandhi

{(Braham Datt x Viamala) x Solitude} x Confidence – *N.V. Shastri*

Blue Ocean x Angelius – *N.V. Shastri*

Indira Sable (Miyabi seedling) – *N.V. Shastri*

It is Better to be Different than Indifferent

Sharad Gatne

Yes Sir, that is my philosophy and I often act accordingly.

Normally roses are chosen for their form, size, fragrance, floriferousness or durability. However, I decided to plant some for their foliage. Crazy idea, *par mein aisahi hoon!*

When I thought about ornamental foliage, thorns or heps, following names came to my mind:

- ***R.omeiensis pteracantha***
- ***R.highdownensis***
- ***R.rugosa Blanc de Coubert***
- ***R.rugosa Frau Dagmar Hastrup***
- ***R.moyesii Geranium***

However, roses are extremely sensitive to and squeamish about the *terroir.* Specially species roses do not appreciate Pune climate. Under such circumstances, only a genius or a lunatic would plant them here, and since I am neither, the only choice left to me was to select some from the H.T and Floribunda roses that do well locally.

To begin with, I settled for following five. One can think of many more!

1) John F.Kennedy (H.T) bred by Boerner and released in 1965.

Befitting its namesake this rose has an impeccable presence. Quite in consonance with the head of a large nation its behavior is dignified and controlled. Never goes all out,

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instead produces only a moderate number of blooms. Emphasis is not on mass production but on class production. Flowers are off white about 12 cm across when open. Form is good enough for winning ribbons at shows. The bush grows to about three feet in height and a foot less in width.

Its *forte* is clean flawless foliage, which even under open field cultivation, matches that of green-house varieties growing under protected regime. A rare feature!

Another hall mark is correct proportion of size of blooms, length of stems and size of foliage. All three bear a perfectly balanced, pleasing relation to each other. Visual symphony, indeed!

A real 36 -24 -36 among roses.

2) McGredy's Sunset (H.T) This rose was born in 1936 to McGredys i.e. even before I was born. The flowers are golden yellow with a faint scarlet flush. Due to scanty petalage they open rather quickly. Most yellow roses fade and shrivel under severe cold spells, but this one revels in severe cold conditions. Its petals acquire a healthy glow and their substance improves as the cold intensifies, a feature which distinguishes it from other yellows. The blooms have a mild fragrance which wafts across and pervades the vicinity, under suitable conditions.

The bush grows to about two feet of height and a little more in width .It has healthy, clean, shining foliage and almost thornless canes which grow rapidly in somewhat sinuous fashion. This is difficult to capture in words but is fascinating to watch!

This vintage rose, though not suitable for show benches is an excellent garden rose, deserving a place in every garden.

3) Granada(H.T) Lindquist. Synonym: **'Donatella'.**

Born in 1963, Donatella is a pretty old cow by now. However, grace does not fade over the years, it mellows! This *signora* is still very popular at 51.

Its cup shaped blooms are not very large, measuring about 9 cm across and have only a limited number of petals, opening rather quickly. The colour scheme is very attractive, though! Gold with a medley of scarlet, pink and nasturtium red. Calling them blooms is somewhat unjust. They are cruets of perfume! It is like having an entire perfume division of Hilton of Paris in your yard. Donatella has inherited this exquisite scent from one of its parents, Tiffany, and has donated it to one of its offspring, Double Delight.

The bushes grow to about two and a half feet in height and almost as much in width. Foliage is somewhat susceptible to mildew.

Then what is it doing here? Wait, Sir, in spite of this flaw, it is still very attractive. It is big bold and beautiful. Deeply serrated edges make it look still more attractive. This along with its fascinating scent make it a very desirable rose !

4) **Charleston** (Flori) Introduced by the house of Meillands in 1963.

A very gay and colourful rose, indeed. A medley of yellow, pink, orange and red, turning to all deep red at maturity. About 6 cm across when open. The bush grows to about two feet tall and as wide.

One wishes that it bloomed a little more freely. However, like human beings, roses are never perfect. If a perfect rose existed at all, everyone would plant that rose alone and other roses would find it hard to find any market! It is the imperfection that motivates breeders to produce newer varieties and the rose lovers to plant them. As it is, monoculture is not good, mono varietal culture is still worse. Anyway we should not unduly worry about its floriferousness. Let us not forget that here we are primarily concerned with foliage_ _ and in that department Charleston excels. It has a large somewhat oval foliage with deep dark polished look with a mirror like finish, which would put the toes of any army top hats shoes, to shame. A lovely sight.

Only Marina, another floribunda, can come anywhere near this rose as far as shining foliage is concerned.

Certainly a rose as gorgeous as a bevy of gypsy beauties!

5) Europeana (Flori). de Ruiter released it in 1968.

It is a red red floribunda of considerable merit. The shade is not as vivid as Olympiad or as iridescent as Bimboro, but is definitely more bright than many other reds!

The bushes grow about two feet tall and a little more across. Five cm blooms come in small clusters, but the clusters are many. The symmetrical crown bears clean, bold and large foliage which is green at the centre with slow, gradual progression to copper shade with distinct reddish edges. The effect is eye –catching.

Not a favourite with exhibitors as the clusters are small, but these small clusters look beautiful when arranged in a shallow bowl, as it affords good exposure of its beautiful foliage, to the beholder's eyes!

A good old rose nobody would ever repent having planted.

Roses usually bloom in flushes. Between the flushes, there are no blooms. Those which flower intermittently have only one or two flowers at any given point of time, so no display value! This means that the foliage of a rose is on view for a longer period than blooms. That is the very purpose of planting roses with attractive foliage and as we are planting them for foliage, some canopy management pays rich dividends. Following care is usually sufficient.

a) Pruning should aim at discouraging upright growth and encouraging the plants to spread as much as possible. Umbrella or dome shape is ideal. Not all varieties will appreciate this move. However with some clever pruning one can manage to get close to our aim. This results in some side benefits also.

I. There is less evaporation of water as the canopy casts shadow at the base, resulting in some saving of water, a precious commodity, presently.

II. Due to the shadow-cast, the ground at the base does not heat up excessively, permitting the roots a cool run and resulting in better vegetative growth.

b) Excess watering and too frequent watering should be avoided with a view to minimize fungal infections. Further, waterlogged condition retards vegetative growth.

c) Top soil should be worked up and loosened at least every alternate week, to enhance soil aeration. This will also help to maintain ideal soil moisture ratio for a longer period, which is conducive to vegetative growth.

d) Insects and pests spoil the foliage which is aesthetically repulsive and also reduces the function of leaves as solar panels— this defeats our very purpose, therefore, preventive sprays are better than curative ones. Thrips, Aphides, Mites, Scales, leaf chewing insects and fungal attacks break at a specific period suitable to them, therefore, with some experience, it is not difficult to anticipate and spray just before the outbreak.

Black-spot spores rise from the ground on to the plant. Therefore lower leaves and especially their under surface should be sprayed carefully. Mildew spores take aerial root and land on the plant, therefore, upper leaves and specially their upper surface should be sprayed carefully.

Some spores of fungi and nymph stages of insects live underground, therefore care should be taken to spray the ground.

e) Very close planting should be avoided as the plants tend to hide portion of each other's foliage.

f) If possible, plants should be budded as half standards or standards, rather than as bushes. This helps in showcasing their foliage to greater advantage.

g) It is of prime importance to feed the roses timely and correctly. Primary, secondary and micro nutrients all have to be administered in right doses at right times. Key to successful rose growing lies in giving balanced feed. Underfeeding results in poor and stunted growth, while overfeeding is sure to result in coarse growth . Imbalance in feeding also results in high susceptibility to diseases! If you want to steer clear of this Scylla and Charybdis dilemma, you can deposit a basketful of mixture of well-rotted cow- dung manure, bone-meal and wood-ash at the foot of each plant and then leave it to the plant itself to decide when, what and how much to take up!

All these being slow release organic manures, last for a longer period .Thrice in a year application is quite sufficient. In local climate, mid February, mid June mid October are suitable times .I have noticed that roses grow best under such a regime.

If one adds a little fishmeal and some oilcake to the feeding mixture, the results are dramatic. This imparts a better substance and a healthy shine to the foliage .I am not sure why, perhaps minute oil still left in the cake reaches the foliage. I am unable to give any empirical explanation about it as I am not expert in transport and translocation of chemicals in plants, but it is a definite observation.

With such care,your effort to plant some roses for the foliage is certain to meet with good success!

Please try it! Good luck!

Saving Labour in a Rose Garden

Prof.A.S. Waranashiwar

Just as I can not live without oxygen, I can not live without roses.

I was suddenly taken ill in the first week of April 2014, due to chronic diabetes, and had terrific swelling on my feet. A doubt was lurking in my mind about kidney disorder and the impending complications. My separation from my dear roses (though temporarily) due to my indifferent health made me all the more pessimistic during this period. Finally, I got out of the health hazard with the expertise of a diabetologist and modern medication. This experience created a strong feeling which had dominated my mind during my career of 33 years as a rose grower : How to save labour in a rose garden?

I know there are no shortcuts to rose growing, but I also know that many young enthusiasts who take up rose growing initially, give up after some time. Can we not save the cumbersome way of rose growing and invent such methods, which will save labour in a rose garden and make gardening less hazardous and more pleasureable? Moreover, the hectic schedule of the young generation and IT professionals do not permit them to spare much time for gardening !

I reflected upon some methods which I had practiced earlier, and did some" loud thinking" with my rose friends. Rose growing does involve tedious work, everyday attention to the plants, a series of daily chores, and all this with an appropriate " Time Management". This is possible if you have a strong will ! So let us go step by step. The aim is to reduce labour in a rose garden.

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A) Limit the number of plants : This will depend largely upon your approach, whether you are exhibition minded or would like to have only a good rose garden for your pleasure. Suppose you are the latter, you can plant varieties which are vigorous, disease resistant and free-flowering. Here are some colour wise good Hybrid Tea varieties :

Red : Gladiator/Toro, Alec's Red, Red Masterpiece, Mr. Lincoln, Moncheri, Oklahoma, Papa Meilland, Black Magic, Olympiad, Kardinal, Veteran's Honor, Shanker Jaikishan, Ingrid Bergman, Vajra, Swapnasundari.

Pink: Sheer Elegance, First Prize, Peter Frankenfeld, Royal Highness, Bride's Dream, Century Two, Maria Callas, Perfume Delight, Sudhanshu, P H Kulkarni, Dnyandev, Swarthmore, Pristine.

Bicolours and Blends: Double Delight, Peace, Chicago Peace, Kronenburg, Love, Lynn

Orange: Touch of Class, Folklore, Cary Grant, Double Helix, Fragrant Cloud, Summer Holiday.

Yellow: Landora, Oregold, Golden Medallion, St. Patrick

White: White Masterpiece, John F. Kennedy, Virgo, Pascali, Dr. Homi Bhabha, White Success, Honor, Garden Party, Viamala.

Mauve: Lady X, Blue Moon, Soft Corner, Blue Ocean.

Apricot: Just Joey, Brandy, Old Timer, Thais, Tanya, Hokotu, Valencia.

Striped: Sahasradhara, Supriya, Manas, Tata Centenary, Abasaheb, Kiss of Fire, Siddharth, Abhisarika, Anvil Sparks.

Fragrant: Double Delight, Fragrant Cloud, Sweet Surrender, Papa Meilland, Mr. Lincoln, Inge Horstmann, Granada, Oklahoma, Jadis, Perfume Delight.

These are just a few. Many of these varieties are for garden –cum- exhibition purpose.

Plant all kinds of " Knock Out" roses .They are very hardy and floriferous and do not need much care! They come under shrub class.

Floribunda and Miniature should occupy at least 20 percent of the total plant population in your garden, which will bring a look of a " full garden". They yield more flowers and attract immediate attention. They, along with their senior cousins- the H.T.s- can create a riot of colour in your garden.

B) Preparation of Soil: If you are lucky to have your rose plants in the ground, you will get amazing results, as one doesn't have to do much for their all round growth and basal shoots etc. They will reward you more than what you do for them. Copious amount of powdered cow-dung manure and a good deal of compost will enhance the structure and texture of the soil. If you have plants in pots, you have to mix the soil, well rotted cow-dung manure and sieved sand at the ratio of 5:3:2 respectively. This will give good drainage as well.

In both cases- for plants in soil or pots- minimum six hours of sunlight is a must !

If you prepare the soil carefully by adding coco-peat in place of sand, it will make the mixture more porous. Remember, half the battle is won if preparation of the soil is made carefully. Preparation of good soil is key to successful rose growing!

C) Watering the plants: Water the plants when you see hairline cracks on the surface of the soil, or you may water your plants on alternate days- except in summer. If your plants are exposed to sunlight for 12 hours a day (say from 7.00 am to 7 pm) in summer on a terrace, you will have to water them every day. However, a green shade net in summer will help stop evaporation. Heavy mulch of pieces of cow dung manure can definitely stop evaporation effectively. Hence protection of shade net and mulching in summer can definitely reduce the need of watering the plants daily. So, retention of moisture

can be easily achieved. Place mulch over the area where you have planted the roses. If you have planted a potted bush, place the mulch around the stem. This will keep the temperature consistent and protect the roses during the early stages of growth. Conditions such as water-logging should be avoided.

You may try a drip irrigation system to keep constant moisture around the plant. The initial investment may be a little more, but will save your labour of watering the plants daily and also take care in your absence, once the source and distribution system is effectively worked out. This will also economize on water . However, conditions such as clogging must be avoided. Due to paucity of space, pot culture has come to stay. Cultivation of roses in pots has some definite advantages. There are no weeds in the pots .The problem of weeds is almost non-existent. You can also shift the pot to shade to delay the opening of the bloom to coincide with the date and time of exhibition!

Use gloves while going for operations in rose cultivation. Protect yourself with a thick pair of hand gloves. This will save you from thorns and injuries. Roses perform best when the soil pH is between 6.00 to 6.5, so please get the soil tested before planting the roses to know exact deficiencies of the soil so as to cater to their needs accordingly. You can save on fertilizers which may be superfluous.

D) Feeding the roses : After they are established, roses should be given fertilizers regularly during the growing season. After pruning in early July and early November, when you see the first few leaves sprout, the feeding programme should begin. Some fertilizers are slow release (e.g. Suphala and other granular fertilizers), so that they need not be applied often. Don't over fertilize the roses, it can lead to diseases. You may sprinkle a good mixture of NPK around the plant on 1st and 15th of every month for steady supply of nutrients. Frequent and light feeding is the best !

E) Pruning roses: Sharpen the secateurs before you take on pruning. Do not over prune your rose plants. Remember that the key to good pruning is to prune with an eye to opening the bush's growth upwards and to allow good air circulation in the centre. Remove suckers as soon as you notice them as they will suck away nutrients from the rose plant. In summer, remove dead heads which are dead blooms.

F) Protect your roses from weather and disease: Mites are quite common among most of the rose varieties. Spray aphids and spider mites off by spraying them away with a jet spray of water every week. For preventive and curative measures to control chewing pests and diseases, a regular spray is essential. A fortnightly spray will do good to ward off these pests, if you are creating garden for your pleasure. However, a weekly spray is essential, if you are an exhibitionist. One insecticide and one fungicide should be mixed in each spray.

Using insecticide like Phorate@ 3gr. to 5gr.to be mixed in the soil per plant is a good measure to combat pests like red scale insects, saving exertion of spraying . Furadon can be effective as well. Plant some 'desi' (Indian) varieties of marigold and also garlic to keep some insects and mildew at bay.

Choosing varieties that are resistant to blackspot and powdery mildew such as Knockout roses is a good choice. But only Knockout roses do not make a beautiful rose garden. You can also protect your roses by applying a fungicide solution around roots at the beginning of rainy season to avert fungal infection.

In fine, saving labour in a rose garden means minimizing exertion to make rose gardening throbbing with interest for a long period. Your " involvement " in roses will turn into a passion, when you will do most of the chores yourself, in small instalments, because you are the 'creator 'of your garden wherein the pleasure will replace the tension of the day!

(La Jola x Caramel Crème): Subrata Ghosh

(Madras x White Masterpiece): Subrata Ghosh

(White Masterpiece x Admiral Rodney): Subrata Ghosh

Summer Care of Roses on Terrace

Ravindra Bhide

This is not the usual article on summer care of roses. This has a different perspective..

Today, in big cities like Pune, Mumbai, Kolkata, Bangalore etc. there are no open spaces available for the planting of roses. So a rose lover has to be satisfied with growing roses in pots on his terrace (rooftop).

However in summer, roses suffer from reflected heat on terraces. In Pune, the temperature rises up to 42 to 43°C and at the same time the humidity goes down to 30, leading to scorching of the plants and the withering of blooms within a few hours. The low humidity results in increase in population of three enemies of roses viz. thrips, mites and scales. To control them one has to spray insecticides regularly.

I have thought a lot on this problem. This year I spread thick jute sacks on the terrace between two lines of rose pots, and while watering the pots I sprayed water on the sacks too. So the sacks became wet and continued wet when water draining from the pots soaked the sacks. It helped to keep the surroundings humid till about 2.00 o' clock and then the soaked jute sacks absorbed the heat without reflection.

This helped in many ways. First, the humidity reduced the propagation of the above mentioned pests. The frequency of spraying insecticides was also reduced. I had sprayed insecticides on 15th of March and then again I was required to spray only on 6th of May. The rose plants remained healthy all through summer and I had to spray insecticide only when

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I saw minor scale infection. Secondly, the rose blooms lasted for 2 to 3 days providing colour to the garden. The upkeep of roses in summer became easy and the rooms below the terrace were cooler too. My wife appreciated this cooling effect .

I found this experiment successful. It was inexpensive, and also saved on the cost of expensive insecticides. Not only can one have healthy and colourful roses, one's family is happy too. I recommend this simple procedure for all who grow roses on their rooftops.

Roses For The Garden

Roses are the gift of price,
Sent to us from Paradise.
More Divine our nature grows
In the Eden of the Rose.

Roses why for silver sell
O rose merchant fairly tell.
What you buy instead of those
That is costlier than the rose?

Kisa'i of Merv

Changing Scenario in growing roses

D.M. Nikhade, Dr. S. V. Supe
and Mrs. Mittal Phirake

While the rose occupies an important position among flowering plants, there are problems in growing them due to natural and human interventions. Gardens are deteriorating, resulting in poor quality of flowers and shorter life of plants.

The changing scenario in growing of roses has confused growers.

Vagaries of Nature

Nature is changing year to year. As shown in Table 1 the distribution of rainfall during 2003-04 to 2013-14 is uneven, uncertain and erratic. The knowledge of distribution of dry spells and amount of rainfall during wet spells (season) is very essential for successful management of roses. Rose development is severely affected if dry spells coincide with the sensitive phenological stage of the roses and it is sometimes beneficial if it coincides with the ripening stage.

Erratic Rainfall :

The last 12 years data (2002-03 to 2013-14) indicates notable variation in total duration of rainfall (65 hrs 58 min. to 187hrs. to 35 min.). Similarly, intensity duration classification reveals the unstable and non-linear behavior of rainfall over this period. The frequency distribution of rainy days with daily rainfall intensity during the crop growing period (June. – Sept.) revealed that 77.77 per cent of rainy days were below 25 mm day rainfall and 15.55 per cent rainy days were between 25-50 mm day rainfall intensity. The year wise distribution of the rainfall over the period of 12 years indicated the rainy days between 30 to 47 during June to September which reveals the non linearity in frequency distribution of rainy days which leads to non-sustainability

in rain-fed rose growing areas. The off-season rains (October. to March.) seem to be erratic as rains received during 2013-14 is 119.9 mm in 11 rainy days. The erratic behavior of rains affected the regular natural growth cycle of the roses. Rose growers need to take into account the change in rainfall pattern and adjust the operations of the roses as per these changes. Some of the guidelines are provided for rose growers to adjust with these changing circumstances.

Rising Temperature :

Rainfall, directly or indirectly, affects growth. The optimum temperature required for roses is 22-28^{0}C during day and 15-18 ^{0}C at night with 60-65% humidity. If the temperature is more than 40^{0}C roses are unable to survive as there is scorching. The temperature and humidity can be controlled with the help of poly houses and green houses.

When the temperature rises more than 40^{0}C using shade-net (which come in varying opacities) to protect plants from severe heat (April and May) is recommended. After removal of the net at the start of the rains, the plants sometimes do not adjust with the climatic changes and dry out. Summer is a crucial period for them and therefore proper care should be taken to protect them from severe heat by watering and with the help of shade nets.

Life of roses:

It is observed that the longevity of roses has reduced in the last few years. Earlier, the life of plants was 7-10 years but now it is reduced to 4-5 years. This is leading to uneconomical 'use and throw' plants. This situation needs to be altered.

In Vidarbha, Maharashtra, the period of November to February is winter and good for roses- they grow luxuriantly and give beautiful flowers. From March onwards the temperature rises and the plants give lesser number of flowers with reduced size. Despite these odds it is observed that certain rose varieties perform well in Vidarbha. The popularly

grown varieties in H.T. are Paradise, Double Delight, Papa Meilland, John F. Kennedy, Super Star and Century Two. Among floribundas the popular varieties are Banjaran, Summer. Snow, Iceberg, Europeana and Charleston. Among the miniatures, Fire Princess, Strawberry Swirl, My Valentine and Baby Masquerade. There is need to try new varieties which will adjust with the varying climatic changes in Vidarbha.

Budding in roses :

Earlier, plants were healthy and beautiful having lustre on leaves and stems. But now-a-days plants look pale, stunted and diseased. This affects the budding programme. Normally budding starts in November. and continues till March. Earlier the budding success rate was more than 90%. The buds dry due to high temperature and unhealthy union of buds. Due to unsuccessful budding there are small and costly plants in the market at the start of the monsoon. The cost of the rose plants and their longevity has direct effect on the economy of rosarians. Varieties like Peace, Chicago Peace, or Kronenberg are very rarely grown because of non-availability in nurseries.

Basal Shoots :

Earlier, basal shoots sprouted in July and winter, old shoots were removed, pruning done, and new shoots allowed to grow, which gave large sized flowers, ideal for rose shows. But today very few basal shoots appear on the shoots, the plant is stunted, and there is little scope for manipulation of the plants for good flowers.

In winter, roses would give abundant flowers. Not any more. One of the reasons for this is not following a proper schedule cultivation. If proper schedule is followed and care is taken a plant can yield 42 big sized blooms on 'Double Delight'.

Pruning of Plants :

Pruning is another important operation to maintain the shape and sprouting of new shoots. But due to vagaries of nature the pruning schedule is disturbed. The ideal pruning period starts from the "Mrug Nakshatra" which normally comes in the first week of June. This year the rains started after 20th July which delayed pruning. This change in the environment needs to be taken into account. Normally two prunings are recommended in a year. In the beginning heavy pruning and afterwards light pruning will help in maintaining the shape of the plants. The light pruning in November. is done to obtain good quality flowers which can be kept in exhibition. Due to change in Nature the pruning schedule should be cautiously planned to avoid damage to the plants and for obtaining good quality flowers.

Pest and Diseases :

The common pests and diseases of roses are becoming more prolific and more immune Earlier, Monocrotophos, Malathion, Blue Copper, Bavistin etc. controlled pests and diseases like Rose Chaffer, scales, mites, thrips etc. and Black spot, yellowing of leaves and die back were controlled by Blue Copper, Wettable Sulphur 50%, etc. But as they have become ineffective, switching over to broad spectrum insecticides, like Confidal, Regent etc. has become the norm. This increases costs and pollutes the environment. It is therefore, necessary to develop pest and disease resistant varieties of roses and restrict the use of inorganic chemicals .

In conclusion, it can be said that eco-friendly technology should be developed so that rose plants can grow in the natural environment. The time has come to change our approach in growing roses. This will provide healthy atmosphere around our house and reduce the pollution of the environment.

Table : Yearly distribution of rain fall, duration and rainy days during season and off-season (2002-02 to 2013-14) at Akola, Maharashtra

Year	Season (June – Sept.) Total			Offseason (Oct. – March.) Total		
	Rainfall in mm	Duration in hrs/min	Rainy days number	Rainfall in mm	Duration in hrs/min	Rainy days number
2002-03	677.6	168.14	33	-	-	00
2003-04	369.5	134.88	30	2.6	0.20	01
2004-05	440.1	70.47	31	76.3	8.40	09
2005-06	718.4	146.06	33	109.0	15.42	02
2006-07	1028.7	151.21	38	5.7	1.50	02
2007-08	818.6	137.32	43	31.6	2.45	02
2008-09	534.8	120.07	41	-	-	00
2009-10	578.6	83.22	26	138.7	11.33	11
2010-11	1008.3	142.01	38	68.0	8.50	05
2011-12	447.4	65.58	37	6.2	0.25	01
2012-13	612.9	162.55	47	61.1	2.59	04
2013-14	774.1	187.35	44	119.9	22.38	11
Total	**8009**	**1572.26**	**44**	**619.1**	**73.42**	**56**
Avg.	**667.5**	**133.02**	**36.75**	**61.91**	**7.34**	**4.66**

Bhopal Rose Convention

Kuldeep Saddy

The Indian Rose Federation (I.R.F.) in collaboration with M.P. Rose Society Bhopal and Deptt. of Horticulture M.P. hosted its 32nd All India Rose Convention and Show at Bhopal from 4th to 6th January, 2014. The Convention was inaugurated and the technical session commenced thereafter.

Ms. Ingrid Verdegem, a delegate from Belgium, spoke on Myth of the Black Roses while a talk on Growing Roses the Organic Way was delivered by Mr. Hans Van Hage from Netherlands. Dr.T.Janakiram of I.A.R.I. New Delhi delivered an interesting talk on Rose Research at I.A.R.I.

The Rose Show was opened to public at 5.30 pm and the delegates had a detailed tour of the show ground where a large number of stalls displaying rose plants, indoor plants, garden tools, insecticides and pesticides etc. were displayed for sale. The majestic blooms of potted rose plants of named varieties in the adjacent open ground was a breathtaking view for the delegates and rose lovers who had thronged into the show ground.

A large dome shaped airconditioned shamiana complex with hundreds of show tables displaying thousands of rose blooms under different categories and colours arranged systematically under different classes in bottles was a sight to be enjoyed. The prize winning entry of 'Golden Medallion' by Capital Project Bhopal was crowned King while the variety 'Happy Talk' by Mr. Kiran More was declared Queen of the Show. Prince of the Show was claimed by variety 'Green Ice' displayed by Mr. A.D. More while Princess of the Show was claimed by variety 'Chatillon Rose' displayed by Mr. A.D. More.

The beauty of the show was enhanced by display of large number of bonsai entries while numerous attractive rose

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arrangements for competition were displayed separately on different set of tables. Hundreds of photographs of rose blooms and rose gardens were displayed very artistically in another section of the hall. Thousands of rose lovers were moving about admiring the beautiful blooms, rose arrangements, seasonal flowers, Bonsai plants and photographs, vying with each other for honours under the huge shamiana. The delegates were enthralled at the sight of excellent quality rose blooms displayed by local as well as out station rose lovers. Everyone was exchanging views and discussing roses till persistent request by the organisers forced us to drive to the hotel, Jehan Numa Palace, for dinner hosted by Shri. Sushil Prakash, President of M.P. Rose Society. All enjoyed the sumptuous dinner while soft music soothed our nerves after a hectic day.

The next day we left for garden tour at 9.30 am. Our first destination was the Vidhan Sabha building. It is a state of art architecture by the famous architect Mr. Charles Correa. The newly laid out rose garden covers over 1500 rose plants of about 300 varieties in artistically laid out beds. The rose lovers moved around the beds admiring the majestic blooms and inhaling the sweet fragrance.

We then drove to Nehru Rose Garden maintained by Bharat Heavy Electricals, a public sector company. It is a beautiful and a very well laid out rose garden covering an area of 2.5 acres. It was dedicated to the people on the 100th birth anniversary of Nehruji in 1989 by the chief Managing Director of the Company. It covered over 4000 rose plants including some very old varieties. The beautiful layout of this garden has been the dedicated work of horticulture department of BHEL and it has been bagging the Best Garden award in the Large Garden (institutional) category for many years.

Our next stop was the small rose garden at Bhopal Memorial Hospital and Research Centre. The garden is situated inside the campus of the hospital which caters to the illness of gas victims who suffered a terrible destiny in one of

the worst industrial tragedies of the world. There are about 220 different varieties of roses blooming in this small garden.

India is a land of sunshine and to use this nature's gift to the fullest, a small net zero energy platinum rated unique building was our next stopover. The building known as Suncarrier Omega Pvt. Ltd. is situated at Khajuri Khurd, Raisen Road, Bhopal. The beautiful rose garden enhancing the environment of the building reflects the expertise of the owner of the complex, Shri Sushil Prakash, our chief host and president of the M.P. Rose Society. Over 400 majestically blooming rose plants including latest varieties stand planted in the very well maintained artistic beds. Certain striped HT varieties viz Cabena, Broceliande and Bicolette were very fascinating which kept us spell bound for quite some time when we were requested to board the vehicles for onward journey.

We then drove ahead for lunch to Irshad Farm and Nursery a few kilometres ahead on Raisen Road. The farm covers a vast green and colourful environment. Thanking our host for the delicious lunch, we drove back to our Show Ground at 2.30 pm reaching the destination at 3.45pm. All the delegates were seated in the spacious and well decorated enclosure when the chief guest Shri Ram Naresh Yadav, Governor of Madhya Pradesh, arrived. After ceremonial welcome he presented Indian Rose Federation gold medals to four illustrious rosarians s/shri V.A. Rode, Mr. Kalyan Chakrabarti, Mrs. Khasnis Nalini and Mr. S. Sudhakar, and trophies to some leading winners in the show. He addressed the packed hall of rose lovers appreciating the services rendered by the Rose Society. He was bewildered at the sight of rose blooms all around and expressed his pleasure to note the love for the Rose by the multitude of viewers.

After his departure, Mr. Ahmed Alam Khan, the President of Indian Rose Federation presented remaining trophies and cash awards to the winners followed by the next round of Technical Session. Mr. Sushil Prakash, President of the M.P.

Rose Society, spoke about outstanding rose gardens in New Zealand which he visited on the occasion of W.F.R.S. convention held there. Dr. A. Patil from Pune spoke on Commercial Cultivation of Roses while Dr. A.P. Singh from New Delhi spoke on Roses Bred by late Dr. B.P. Pal. The Annual General Meeting of the I.R.F. was held after the technical session.

The third day was earmarked for tours either to Sanchi or Bhimbetka, both of historic importance, in the forenoon followed by Heritage Walk in the afternoon. The heritage walk culminating at Taj-ul-Masjid, one of the biggest mosques in Asia, unfolded the mysteries of the heritage buildings & sites.

Modern Bhopal, situated in midst of two artificial lakes, is a place where one can see the richness of tradition intertwined with the modern life. Bhopal has successfully transformed into a sprawling city with new wide roads and vibrant landscapes, majestic hills and woody forests.

The Rose Society has been spreading the message of peace and harmony through roses. The city of Bhopal boasts of over thirty institutional/public rose gardens and equal number of private rose gardens and large number of nurseries.

The delegates returned to the venue in the evening at about 5.00 pm. After enjoying the evening tea and thanking the organisers for the excellent arrangements, we bid Adieu to each other and returned to our hotels for return journey. The sweet memories of the great event will remain cherished in our minds for years to come.

Bhopal Memorial Hospital & Research Centre, Bhopal

Jawaharlal Nehru Rose Garden BHEL Bhopal

Suncarrier Omega Garden Bhopal

Annual Report of The Rose Society of Pune for the year 2013-14

During the year 7 monthly meetings were held where the speakers Dr. Yashwantrao Hande, Mr. Sharad Gatne, Mr. Arun Patil, Mr. Ashish More, Dr. Mrs. Aruna Atre, Mr. Ramrao Jagtap & Mr. B. S. Thipse delivered lectures on various topics like Rose Hybridisation, Preparing compost at home, Tissue Culture, Pruning & transportation to the venue, Pre plantation preparation, selection of varieties & Judging of roses in the exhibition. One monthly meeting was held at Mr. Ramrao Jagtap's nursery at Magarpatta where the members could see the various tools required for gardening, planters, pots, no. of varieties of roses, lotus, chrisumthemums, indoor plants, foliage plants etc. Members also visited a makeshift Bamboo House erected at the nursery.

During the monthly meetings the response for rose parade - a mini exhibition, was overwhelming. The winners – Mr. Ganesh Shirke, Mr. Mancher Irani, Mrs. Jayashree Jabade & Smt. Bhagyashri Kiwalkar were awarded with Late Khodabanda B. Irani medal. Hearty Congratulations ! Since January this year we have made 2 sections in the rose parade viz. participants with less than 50 pots & participants with more than 50 pots to encourage the new comers.

The Monsoon show was held on 31st August & 1st September. Dr. Deepak Tilak, Vice Chancellor, Tilak Maharashtra Vidyapeeth was the chief guest. The show was inaugurated at the hands of renowned realtor Mr. Shashank Paranjape of Paranjape Builders. This year's " Vijay Pokarna Gold Medal of Honour" was presented to Mr. Viraraghavan at the hands of chief guest Dr. Deepak Tilak. Ex President, Mr.Arun Patil sponsored " Progressive rose farmer" award was given to Mr. Sanjay Mahajan of Satara District. Mr. Patangrao Kadam, Minister for Forests & Rehabilitation, Maharashtra Govt. also visited the exhibition.

The Test cum Trial Ground facility was inaugurated at the hands of Mr. Viraraghavan, Mr. B. S. Thipse & Mr. Ramrao Jagtap. Other dignitaries present were Mr. G. Kasturi Rangan, Mrs. Girija Viraraghavan, Mr. Suresh Pingale, Smt. Nalini Khasnis, Mr. Arun Patil, Mr. Sharad Gatne, Mrs. Anupama Barwe, Mr. M.N. Kawade etc.

The prizes were distributed at the hands of Mrs. Girija Viraraghavan. Mr. Ganesh Shirke won both King & Queen trophies while Prince of the show was received by Tilak Maharashtra Vidyapeeth & Princess of thee show by Mr. Mancher Irani. Hearty Congratulations to all the winners ! The prominent varieties getting rewards in the show were – Moonstone, White Success, Cary Grant, Blue Sky, Rhapsody in Blue, Red Triumph, touch of Class, Merylene Munroe, Rina Hugo & JRD Tata.

The Winter rose show was held on 11th & 12th January 2014. Chief guest was Dr. Deepak Tilak. Mrs. Usha Jamma was awarded this year's " Late Laxmibai Anant Naik" silver medal. The " Progrssive Rose Farmer " award was given to Mrs. Laxmibai Parvekar from Savana village of Yawatmal District.

The prizes were distributed at the hands of well known big screen artist Ms Resham Tipnis. The display with 200 roses of Double Delight fascinated her. Mr. Ashish More bagged King & Prince while Mr. Mancher Irani & Pune Municipal Corpn. Bagged Queen & Princess resp. The prize winning varieties were Mount Shasta, Fontain Blue, Diana Princess of Wales, Orange Splash, Softy, Aparna, Blue Ocean etc.

Our members received the honours elsewhere also.

Life Member of the rose society Mr. Brahmadeo Ram Pandit received " Padmashree" at the hands of Hon. President of India H.H. Mr. Pranab Mukherjee in a grand function. Joint secretary of the rose society Smt. Bhagyashree Kiwalkar received Vishwa Foundation's " Adarsh Mata " prize. Prof. Shridhar D. Mahajan, renowned Botanist & Environmentalist

& Hon. Member of the rose society was felicitated by Pune Municipal Corporation on the occasion of World Environment Day at the hands of Mrs. Vandana Chavan, MP from Pune.

On the IRF Field

During the Bhopal convention, Ex president of the rose society & Ex Treasurer of IRF, Smt. Nalinitai Khasnis was awarded "Gurubaksha Singh" Gold Medal at the hands of H.H. Ram Naresh Yadav, Hon. Governor of Madhya Pradesh.

As usual the Punites were in the large group. Mr. Ashish More bagged top 7 prizes except the King. Mancher Irani, Prasad More & Dr. Vikas Mhaskar also bagged the prizes. Mrs. Anupama Barwe got elected in the elections for the post of " Member" during the AGM,.

During the year following members – our Ex Vice President Mr. Haribhau Rahatekar,Manager of Tilak Smarak Mandir Mr. Sadashivrao Gupte, our donor Smt. Nalinitai Gupchup, Mrs. Hemlata Mehendale, Smt. Malati Joglekar, Mrs. Sunetra Chimbalkar, mother of Mr. P.D. Sathe Smt. Prabhavati Sathe & Mr. Suresh alias Bhai Jagtap passed away. May they rest in peace.

Every year the elections are held for 5 posts of the Managing Committee. This year two candidates withdrew their nominations so as to make the elections unopposed. Thanks to them. Mr. Mancher Irani was elected as Vice President while Mrs. Jayashree Jabade, Mrs. Geetali Tilak Mone, Mr. Pundlik Nimhan & Mr Sangram Jagtap were elected for the post of Member.

The Rose Society is thankful to –

1. Mr. Vijay Pokarna for the donation of Rs. 1,00,000/-; Mr. Mancher Irani for sponsoring the "Late Khodabanda B. Irani" medals ; Mr. Mancher Irani & Mrs. & Mr. Suresh Pingale for cash prizes to the winners in flower arrangement sections in both the shows; Mr. Arun Patil for sponsoring "Progressive Rose Farmer" award; Tilak Smarak Mandir Trust for the

donation of Rs. 1,25,000/-; M/s Amit Caterers for the donation of Rs. 67,500/-; M/s N.A. Joshi Polybag Promotion Centre for the donation of Rs, 3,90,000/-

The Rose Society of Pune is also thankful to –

1. All the participants, judges, donors of the trophies, media & the rose lovers who attended the shows. The volunteers of Apte Prashala & their guide Mrs. Shirke; Mr. Agarwal of M/s. Balaji Agencies for providing softdrink bottles, all stall holders & advertisers of Gulab Mitra.; Kesari Mharatta Sanstha for printing of Gulab Mitra & M/s Shree J Printers for printing Gulab Mitra covers; Mr. Ganesh Shirke, Miss Akanksha Kumbhojkar & Mrs. & Mr. Subrata Ghosh for the beautiful photographs of roses for Gulab Mitra covers. Mr. Vijay Pokarna & Mr. Ashish Naik for sponsoring gold & silver medals; Auditor Mr. Mahendra Shah, Managers & staff of Tilak Smarak Mandir; all the past presidents for their kind cooperation

2. The Managing Committee of the rose society is as follows:

President	:	Mr. Ravindra Bhide
Vice Presidents	:	Mrs. Chandralekha Jagtap Mr. Mancher Irani
Hon. Treasurer & Vice President	:	Mrs. Meera Ghorpade
Hon. Secretary	:	Mrs. Bhagyashree Takle
Hon. Jt. Treasurer	:	Mrs. Supriya Gadgil
Hon. Jt. Secretary	:	Smt. Bhagyashree Kiwalkar
Members	:	Dr. V.C. Agashe, Mrs. Jayashree Jabade; Mr. Sangram Jagtap, Mrs. Usha Jamma Mr. D.S. Moholkar, Mr. Pundlik Nimhan; Mr. Ganesh Shirke, Mrs. Geetali Tilak Mone; Mrs. Jayashree Yadav

Vidarbha Rose Society, Nagpur

Reg.No. 82/86 & F-5711 (Nagpur)
Address: C/o. Dr. A.S. Sable, Flat No. A-11/3,
Sarkari Karmachari Gruh Nirman Sahakari Sanstha,
Ravinagar, Nagpur - 440 001. Tel : 0712 2543667

Report on Vidarbha Rose Society, Nagpur

The Society establish in the year 1986 and organized successfully two All India Rose conventions during the year 1988 and 2003. Every year Annual Rose Show is being organized on grand scale. The Society's popular rosarian received Indian Rose Federation Gold medal namely - Mr. Brahmdatt Nangia Vijay Pokarna Gold medal 1990. Dr. Arvind S. Sable, Vijay Porarna Gold medal - 1991, Dr. N.V. Shastri, Vijay Pokarna Gold medal, Mrs. Aruna Babhulkar, Gurubaksh Singh Gold medal.

The Society organizes various activities on gardening, rose culture, commercial flower growing for flower growers organizes seminars, Demonstration, workshop, etc.

Dr. N.V. Shashtri's hybridized Roses are released during the Annual Rose Show every year. The Society's members have attended All India Rose Convention held at different places in large numbers and participated in All India Rose show and in scientific deliberations.

Office Bearers : President - Mrs. Sanyogita Devi Dhanwatay, Vice President - Dr. Pallavi Vaidya and Mr. Sanjay Dahiwade, Treasurer - Dr. R.B. Gorde, Secretary - Dr. Arvind Sable, Jt. Secretary - Mrs. Aruna Babhulkar and Mr. M.D. Meshram.

Executive Members : Mr. M.B. Wakde, Mr. B.K. Agrawal, Mr. Vilas Salpekar, Mr. Dilip Ingle, Mr. Kamal Mehadia, Mr. C.G. Itkelwar, Mr. Wasudeo C. Adhao, Mr. R.M. Thakur, Mr. S.B. Patil.

Modern Roses 12

Book Review

By Suresh Pingale

My love for roses started way back in 1963, more than 50 years ago as a hobby. Being a farmer I thought of experimenting with rose cultivation as a profitable farming enterprise. Initially the information and knowledge of such innovative farm venture was not easily available in India. Though the Rose Society of Pune was established in Pune in 1962, none of the members knew techniques and practical methods of cultivating roses professionally for market oriented cut flower production. Thereafter I joined the American Rose Society and also the Royal National Rose Society of Great Britain. Both the Rose societies recommended to me some books on rose growing in general and rose cultivation for cut flower production in particular. Thus started my study of roses in a little serious manner through books. During this period I got a book from the American Rose Society- Modern Roses, a compilation of all commercially available roses in the US and elsewhere in Europe.

This book called **Modern Roses 8** was published by the American Rose Society in collaboration with the McFarland Company. It was intended to be the International Check-List of Roses. During this period the ARS was authorised to operate as the International Registration Authority for Roses (IRAR). It is claimed by the editors of the subsequent editions of this book that it is the comprehensive list of roses in cultivation or of historical or botanical importance.

The history of this book goes back to as early as 1921 when it was felt by hobbyists, nurserymen, hybridisers and scientists working in this field that a compilation of all roses should be undertaken to facilitate the correct and easier

identification of roses . It was felt that this kind of directory of roses should also contain all relevant information about a particular rose variety, or cultivar. This endeavor required lots of study, research and meticulous compilation of thousands of varieties of roses. The ARS took this responsibility and started publishing lists of roses in their annual. The late Dr .J. Horace McFarland, who was Editor of the Society's publications, began to compile rose names and descriptions which he published in Modern Roses in 1930. This was the first edition of Modern Roses culminating into the present/current publication Modern Roses 12.

The first of these volumes of Modern Roses, which I could procure, namely the Modern Roses 8 was published in 1980. It confined to about 20,000 rose varieties. Each of this variety was listed with:

1-Name including trade name and synonyms, if any,

2-Classification, such as HT,F, Min etc

3-Hybridiser, nursery which introduced it

4-Year of introduction

5-Parentage

6-Detailed description

7-Awards won by it.

This edition gave addresses and some information about hybridisers, nurserymen and other eminent rosarians. Thereafter the subsequent edition namely Modern Roses 10 published in 1993 improved and added information in its appendices. The additional information included patented registered trade name with all synonyms, a list of unregistered cultivars and a list of hybridisers and introducers with addresses. These information was very useful for all kinds of rosarians. I'm sorry to observe that all these additions are dropped in the newest edition i.e. Modern Roses 12.

The latest and current volume, Modern Roses 12 is a massive hardcover monograph 12 by 9 inches in size, weighing about 3 kg. It has 576 pages and about 40,000 varieties of rose with all detailed information. It is a wonderful reference compendium for a serious rose enthusiast. It is edited by Marily A. Young and Phillip Schorr of the American Rose Society. It is printed very well with 250 high quality pictures of roses, both newer ones and old historical legends. I'm really very appreciative of the tremendous efforts and research that has gone into preparing this volume. The office bearers and its editors and researchers do deserve our gratitude.

In my opinion a small lacuna I am finding in this otherwise wonderfully useful reference book is that it does not include a couple of appendices which were included in earlier editions. Absence of 'Cross reference of synonyms' and 'List of Non-Registered Roses' would restrict search of certain rose varieties.

This book is available for $ 99.95 at:
The American Rose Society,
P. O. Box 30,000,Shreveport,
Louisiana 71130-0030,
USA.

Glimpses from IRF President's Garden

Glimpses from IRF President's Garden