

Regional World Rose Conference Hyderabad 2014

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

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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.



RADIANCE

LA FRANCE



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.



ROSA CLINOPHYLLA

ROSA GIGANTEA

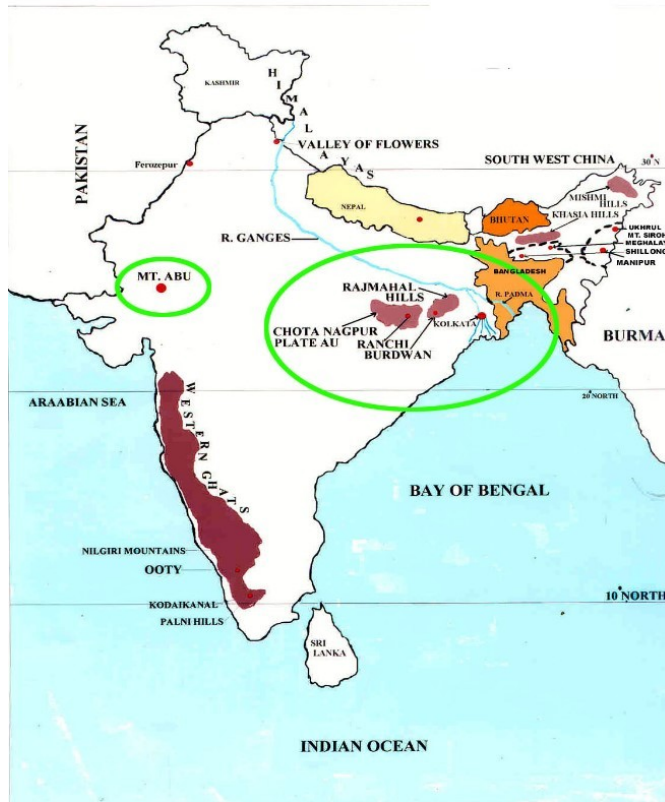


It is indeed fortunate that these two species – *R. clinophylla* and *R. gigantea*, perform well in a wide range of warm climates. *R. clinophylla* is perhaps the world's only tropical rose species. *R. gigantea*, on the other hand, grows luxuriantly in sub-tropical climates without harsh frosts. In 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*

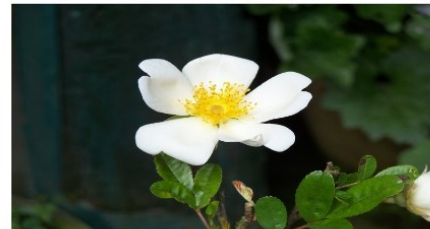
Three forms exist, adapted to warm moist climate (Bengal form), warm dry climate (Chota-Nagpur form) and subtropical form.

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 :

***R.clinophylla*, Bengal form---- habitat: warm moist climate**



***R.clinophylla* habitat; typical landscape of the interface of the Himalayas and Bengal plains**



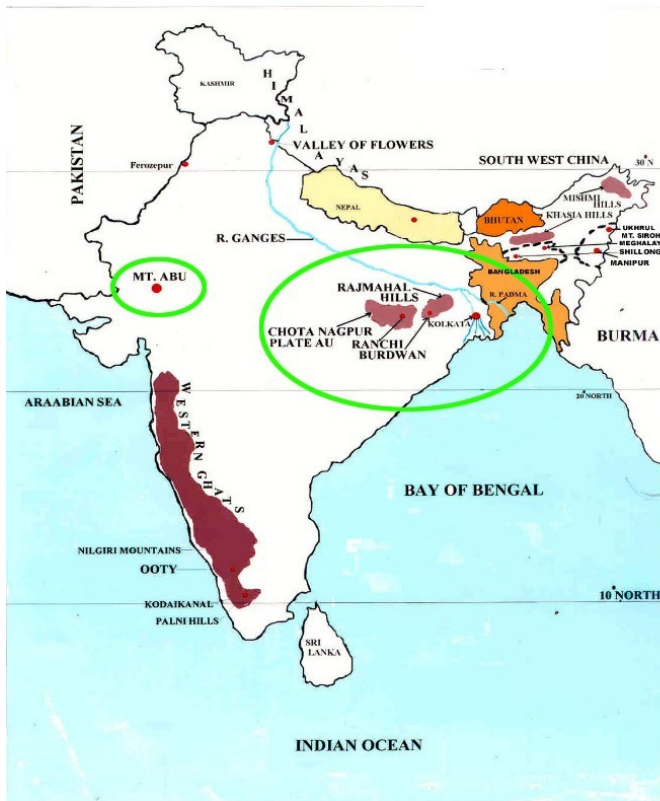
“On the 7th of May (1850), about 80 miles in a straight line from the foot of the Himalaya, we found the stratified sandy banks, which had gradually risen to a height of thirteen feet, replaced by the hard alluvial clay of the Gangetic valley, which underlies the sand: the stream contracted, and the 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.

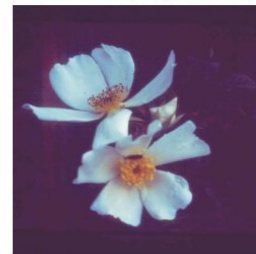
In some ways getting a plant of this variant proved to be the most difficult of searches. Even in the late 19th century the species was characterised by the unusual feature of appearing in profusion where the swampy conditions suited, but again showing up very much further on – many apparently suitable 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.

***R. clinophylla* Chota Nagpur form-habitat: warm dry climate**



**Narender Singh of Ranchi
would have found this form
of *clinophylla* here**



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.

R. clinophylla sub tropical form at Mt Abu



Mount Abu Rajasthan



Mount-Abu lake margin where we found the species

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.

R. clinophylla: sub tropical form at Mount Abu



Bush of *R. Clinophylla*, Mount Abu form, growing on field boundary, Oriya Village, Mt. Abu. Note the size of the plant.

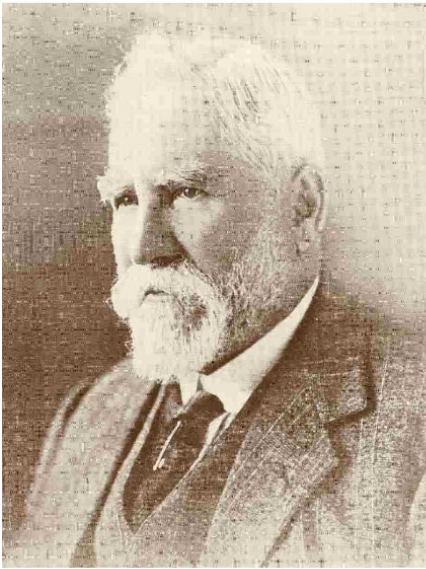


R. clinophylla- sometimes called
R. lyelli

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*.

Now, to the search for *R. gigantea*

Discoverers of *R.gigantea*



Sir George Watt



General Sir Henry Collett (3rd from right)



Frank Kingdon -Ward

The species was discovered by Sir George Watt in 1882 and later by Frank Kingdon Ward. And Sir Henry Collett who found the rose in Burma also in the 1880s.

Map showing where *R.gigantea* was found



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,

***R. gigantea* habitat**



Sirohi forest near Ukhrul town Manipur State



***R. gigantea* climbing tree**



Sirohi Lily- *Lilium mackliniae*

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.

M.S. Viraraghavan

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

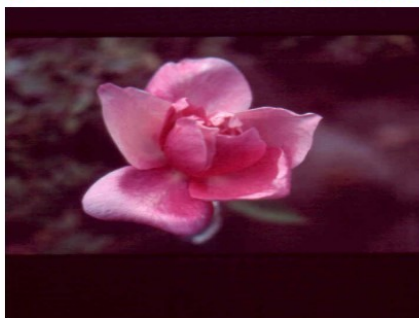
First steps in breeding with *R.clinophylla*



R.clinophylla in water



Mrs B.R.Cant x *R.clinophylla*



'PinkPink' : Mrs B R Cant x (Mrs B R Cant x *R.clinophylla*)

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* (Bihar 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.



R.clinophylla x R. bracteata

'Landmont'

Landora x{ Montezuma x
[Little Darling x(*R.clinophylla*
x *R.bracteata*)]}



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'. Re-crossed into the yellow H.T. 'Landora' ('Sunblest') produced 'Landmont' which 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 my breeding line in the hope that evergreen roses would result.

Garden hybrids from *R. clinophylla* (tetraploid group)



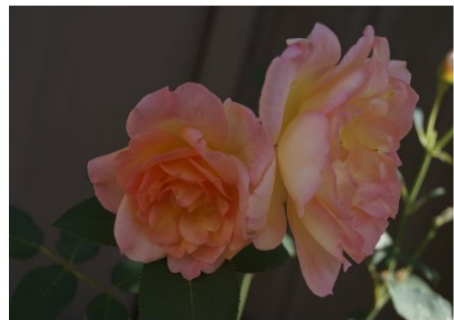
Ganges Mist



Silver Dawn



Narender (Pat Henry in the USA)



Stan Henry

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-crossing ‘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 *laevigata* 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.

Reve d'Or x PinkPink seedlings



Garden hybrids from *R. clinophylla* (diploid group) Buruguls, Ganges Nymph

Ganges Nymph



Reve d' Or x Pink Pink x Camellia Temple Rose (China)

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 serratifetala*. The flowers have a very prominent green eye, which is attractive or not, according to taste.

Two further diploid lines



2.27 x Pink Pink

Telengana Pink(found China) x
Mrs. B. R. Cant x (*R.clinophylla* x
R.gigantea)



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.

R. gigantea

***R.gigantea* in Kodaikanal**



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.

Diploid gigantea hybrids



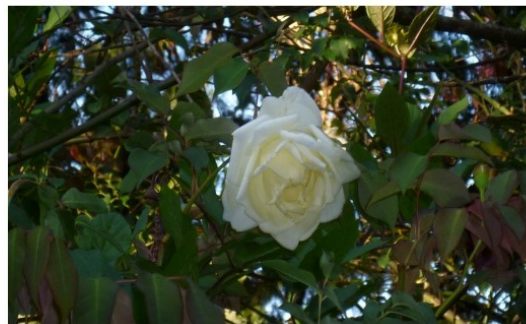
Amber Cloud



Manipur Magic



Sir George Watt



Sir Henry Collett

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 'Reve d'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.

First hybrids of *R.gigantea* – triploid / tetraploid group



Maebara's Dream



Frank Kingdon Ward



Evergreen Gene

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.

Newer hybrids of *R.gigantea*



Naga Belle



Allegory of Spring

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.

More hybrids of *R.gigantea*



Sirohi Sunrise



GoldenThreshold (in Serbia)

The use of the floribunda 'Brown Velvet' with 'Maebara's Dream' produced 'Sirohi Sunrise' a pillar rose with brownish 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.

Some newer hybrids



Dr. N.C.Sen / Maria
Cecilia Freeman

Golden
Threshold x Naga
Belle



More new hybrids

Vishnupriya/
Helga's Quest



Unknown pink H.T.
x Naga Belle

Tea roses in the *R.gigantea* line



Aussie Sixer



Faith Whittlesey



Padmasambhava/ Lotus Born

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.