BOTANIST AND GREEN VISIONARY

UP CLOSE WITH DR. PATRICK BLANC

Interview by Vincent Cossé and Angelia Sia

> THE HORIZONTAL IS FINISHED – IT'S FOR US. BUT THE VERTICAL IS STILL TO CONQUER! GREEN WALLS REINTRODUCE NATURE IN THE CITY, VERTICALLY, MAKING GOOD USE OF LOST AND LEFTOVER SPACES WITHOUT AFFECTING HUMAN ACTIVITIES.

CITYGREEN interviews Dr. Patrick Blanc. Just returned from his overseas expedition in Borneo, the celebrated botanist and green master was already packing for a new trip to South Africa. Despite his fully packed agenda, Dr. Blanc exhibited keen interest and extreme patience in receiving the interview. CITYGREEN brings you the details.

***CG*: CITYGREEN**
DB: Dr. Blanc

***CG*: We are looking forward to hearing your speech at the International Skyrise Greenery Conference in Singapore. Is this going to be your first visit to our tropical city?**
DB: I made my first trip to the rainforests of SouthEast Asia when I was 19. The region is incredibly rich in terms of biodiversity. Singapore is a regular place for my observations and I am always fascinated by the diversity of plants in the Bukit Timah Nature Reserve or MacRitchie Reservoir. I remember in 1991, as a young researcher, I was delighted to find a native species of aquatic plant at Bukit Timah, officially named 10 years later and safekept in the Singapore Botanic Gardens Herbarium. Today, I am glad to share my experience at the Conference in a familiar environment!

***CG*: As a scientist, you are living out a passion for the rainforest understories. What is so interesting about this arcane world, previously disregarded by the research?**
DB: As a researcher for the National Centre of Scientific Research, I study the many strategies developed by plants to live in harsh environments, poor in light, water or nutrients. In the understorey of tropical forests, plants receive as little as 1% of the sunlight, resulting in a paradoxical explosion of biodiversity! Plants have developed countless techniques to adapt, which we only start to understand. In the more exposed situations, such as the forest edges, the dazzling light generates hyperactivity and a tough competition among the flora and fauna, leading to a reduction of biodiversity. Perhaps there is something that humans can learn about it, when imagination makes it possible to live in harmony with limited resources.

***CG*: You are also an artist in the spotlights of green architecture. Where is the connection between your research and vertical greenery?**
DB: I have created the Vertical Garden (Mur Végétal) to reintroduce nature in the city. This concept is derived from the many observations I have made in natural places. A scientific approach is essential for designing the whole system and for selecting the plant species suitable for each peculiar location.

***CG*: Do you mean that the origin of the plants has significance in your compositions?**
DB: My emphasis is on choosing the right plant for the right location, to reduce the problems of maintenance. Yes, I preferably use native plants because they are perfectly adapted to the local climatic conditions. This approach is critical in the harsh environments I have experimented in Qatar, the Canary Islands or California. In temperate countries, I would use plants from different continents, but similar biotope. The most important is to develop vegetal diversity inside ecological unity. For indoor works, conditions are similar around the world, and I use a broad palette of tropical plants. In Singapore, I would use native plants from the Malay

OPPOSITE Athenaeum Hotel, London, 2009. Tallest Garden in Britain, the Living Wall of the Athenaeum Hotel stretches from ground level to the 10th floor penthouse suite.
BELOW Pont Juvénal, Aix-en-Provence, 2008.

Peninsula and if need be, extend my source to other Southeast Asian countries. The real challenge is to find the right supplier, the right nursery propagating these native species in the right way.

***CG*: Are indoor compositions sustainable, considering the dry environment of air-conditioned buildings?**

DB: My Vertical Garden can be implemented indoor and outdoor, in any climatic environment! Plants growing on indoor walls naturally transpire, creating a layer of humidity between the Living Wall and the dry ambient air. After a while, the garden generates its own ecosystem and balance. Indoor, it is important to assess the available light and air movement at different location of the wall. Plants are chosen accordingly. Even though I favour shade dwelling plants, artificial light is often necessary.

***CG*: Your Living Wall doesn't use soil at all! How many species can survive in these conditions?**

DB: Soil is merely nothing more than a mechanic support. Only water and dissolved minerals are essential to plants, together with light and carbon dioxide to conduct photosynthesis. Wherever water is available all year long – as in tropical forests or in temperate mountain forests – plants can grow on rocks, tree trunks, and slopes free-of-ground. In Peninsular Malaysia for instance, among the 8,000 species recorded, 2,500 species grow without any soil!

***CG*: You can use up to 200 or even 300 plant species on the same wall. Do more species require more maintenance?**

DB: There is a common misconception about diversity and maintenance. Using many appropriate species actually increase biodiversity and reduce maintenance: fewer diseases, fewer parasites, and increased possibilities in terms of design. People feel the Nature when they comment my compositions. It is because I use a lot of different species. My walls require minimum maintenance, twice to three times a year only. Trimming is generally an annual event. Some plants germinate on other parts of the wall carried by the wind, the gravity or the birds. I just ask my clients to let nature take over.

***CG*: Is the Vertical Garden sustainable? What about the water issue?**

DB: Once installed, a Vertical Garden is more self-sufficient than a traditional horizontal garden. An automated system waters the plants from top to bottom. It's very much like in nature, when the water runs down the rocks and cliffs. There is no loss of water: all water drained at the bottom of the watering system is re-used. No soil means no percolation, therefore no wastage. Water can also be recycled from the air-conditioning system of the building like in my installation at Melbourne Central.

***CG*: What is your approach, step by step, to create a Vertical Garden?**

DB: First of all, it is essential to choose the right plant species for the right place, and a botanical scientific background is much better than a technical or management background! I study the environment of the wall and I choose understorey plants for shady locations like the ground level of narrow streets and tall buildings. In urban canyons lined with skyscraper, I have to consider the additional wind, overheating and poor air quality. For interior air-conditioned environment, I do consider the lower air humidity.

Sadly, architectural arrangement is often overviewed in vertical greenery. It should be worked out upstream. Design and implementation should allow each leaf to catch the maximum amount of light. To prevent competition, I always put together the species with similar growth and energetic needs. They are distributed on the Vegetal Wall according to the quantity of heat, moisture and light available at different levels. I keep for the top the plants that love sun, withstand wind and the drop in temperature during night and the cold season. I pay attention to the texture and form of the leaves. Curvy leaves give the best effect. I prefer leaves to flowers and I avoid species like trailing vines, as they become messy and too hard to maintain. I also consider colour blending from a distance.

Progressively, the wall will establish its own way of life. I let Nature take over! With a proper initial setting, the wall can last indefinitely with minimum maintenance.

***CG*: Cities are growing taller. Is there a limit to the height of a Vegetal Wall?**

DB: The height of the buildings is not a problem. At high levels, the wind has to be considered. But unlike Miami and Hong Kong, there are no typhoons in Singapore! In a windy city like Sydney I am currently working with Jean Nouvel to wrap a 180-metre high facade with large panels of 20 metres by 7 metres. With proper study, there is no limit to a Vegetal Wall!

***CG*: It has been quite long since you first created the Vertical Garden. In your opinion, have the different technologies improved significantly?**

DB: I fine-tuned the Vegetal Wall during my studies as a botanist, after several years of experimentation. I have tested for about 40 years many of the methods proposed today in the market. So far, I am still attached to the technique I finally developed about 25 years ago, which simply mirrors what happen in the Nature, on the rock face of a waterfall or on the bark of a host bough. It is the most effective in terms of investment, weight and maintenance.

***CG*: Can you share your insights on what vertical greenery can do for a city-state like Singapore?**

DB: As Singapore is running out of space, verticality is a new frontier to explore. The horizontal is finished— it's for us. But the vertical is still to conquer! Green walls reintroduce nature in the city, vertically, making good use of lost and leftover spaces without affecting human activities. After over 20 years of implementation in temperate and tropical climates, Vegetal Walls have proven their ability to organise themselves perfectly, creating life, art and beauty, providing shelter for biodiversity, saving energy and purifying air in the city! I am very confident that vertical greenery has a promising future in the Garden City.

LEFT Green Symphony at
Taipei Concert Hall, Taipei, 2007.

> “PLANTS GROWING ON INDOOR WALLS NATURALLY TRANSPIRE, CREATING A LAYER OF HUMIDITY BETWEEN THE LIVING WALL AND THE DRY AMBIENT AIR. AFTER A WHILE, THE GARDEN GENERATES ITS OWN ECOSYSTEM AND BALANCE.”

BELOW CaixaForum, Madrid, 2008. Designed by studio Herzog & de Meuron, the former power station in the heart of Madrid has been converted into a lively cultural center. The 24-metre high Vertical Garden on the plaza offers a striking contrast with the rusted iron top of the restored building.

Musée du Quai Branly_

THE VEGETAL WALL

Le Mur Végétal, or Vegetal Wall, is soilless and composes of three parts: a metal frame, a PVC layer and a felt. The metal frame is hung on a wall or can be self-standing, and the waperproof PVC sheet (about one centimetre thick) is riveted to this metal frame. This is followed by the felt layer, which is stapled onto the PVC. The felt offers support to the roots. It is soaked by capillary action with a nutrient solution flowing down the Vegetal Wall by gravity. The whole weight of his 'Vertical Garden', including plants and metal frame, is estimated to be less than 30 kilograms per square-metre. The Vegetal Wall is protected in particular by copyright.

Radeau des Cimes

A RAFT IN THE CANOPY

Assisting Professor Francis Hallé in 1989, Dr. Blanc coordinated the first expedition of Radeau des Cimes in the remote Amazon rainforest. The international group of scientists studied the unexplored biodiversity of the canopy from a giant inflatable raft conveyed by air dirigible to the top of the trees, 40 metres above ground.

Book cover

THE VERTICAL GARDEN: FROM NATURE TO THE CITY

In this luscious, oversize, all-colour book, Dr. Blanc explains how to create green walls using more than 1,000 plants, drawing on his observation of natural milieus, his technique of growing on vertical surfaces, his savoir faire and his passion for plants. (Publisher: W. W. Norton & Co.)

Dr. Blanc is the inventor of the Vegetal Wall and undisputed master of vertically-planted gardens. He spearheaded a world trend and interest with his masterpieces. Botanist, Doctor of Science and Director of Research at the esteemed French National Centre of Scientific Research (CNRS), he has dedicated over 30 years to shade-dwelling plants of tropical forests. His work is regularly honoured with prestigious prizes, including the Academy of Sciences Award in 1993.

Dr. Blanc has completed over 250 projects in public and private spaces with the most renowned architects. His indoor and outdoor installations have transformed otherwise mundane structures into green works of living art. They overgrow the vertical surfaces of Fondation Cartier and the Quai Branly Museum in Paris, the Marithé & Francois Girbaud boutique in Manhattan, Caixa Forum in Madrid, the Siam Paragon mall in Bangkok and the Museum of Contemporary Art in Kanazawa, Japan.

LEFT Dr. Blanc at work: climbing Tepui Kukenan in Venezuela.